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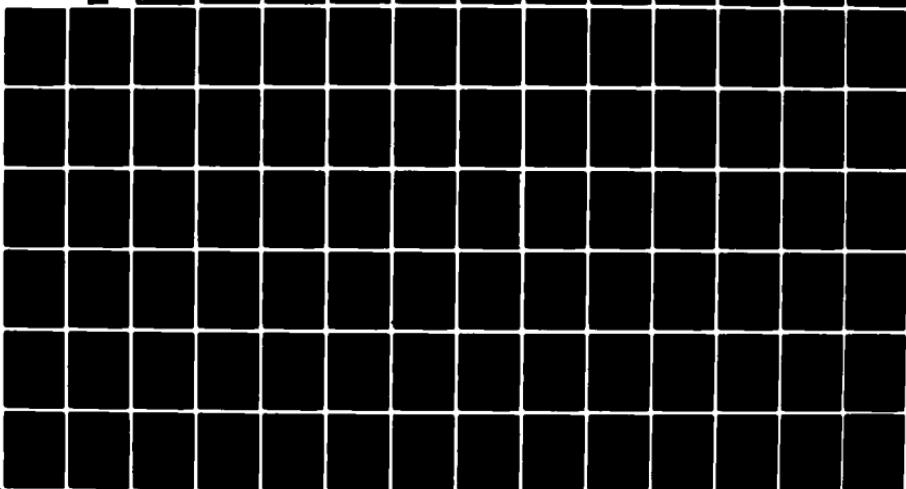
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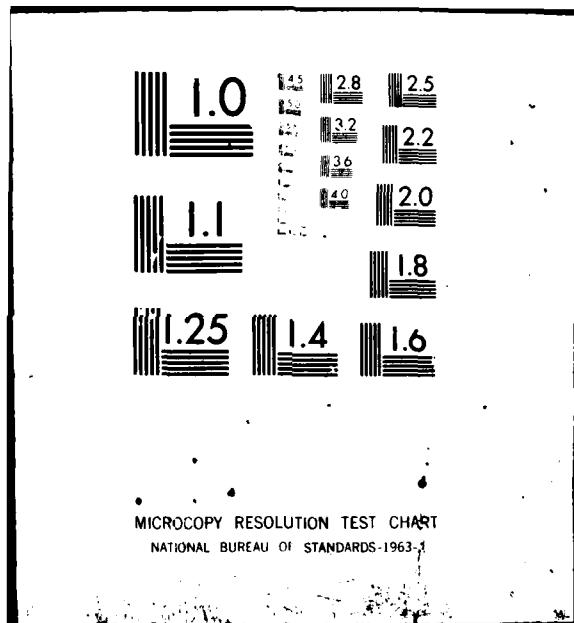
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A COMPREHENSIVE STUDY OF THE  
**TOCKS ISLAND**  
**LAKE PROJECT**  
**AND ALTERNATIVES**

JUNE 1975

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**URS/MADIGAN-PRAEGER, INC.**  
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INSTITUTIONAL ALTERNATIVES

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## **INTRODUCTION**

This "Comprehensive Study of the Tocks Island Lake Project and Alternatives" is divided into five volumes or parts as follows:

- A -- Analysis of Service Areas and Resource Needs
- B -- Review of Tocks Island Lake Project
- C -- Analysis of Alternatives to Supply Resource Needs
- D -- Institutional Alternatives
- E -- Land Use and Secondary Effects of the Tocks Island Lake Project

Brief descriptions of each of these five parts is contained in the Introduction in the Part A volume. Also presented in that volume is a summary of the project's background and development; a table of contents for the complete study; and listings of Study Management Team members and Consultants involved in the study effort.

## CONTENTS - PART D

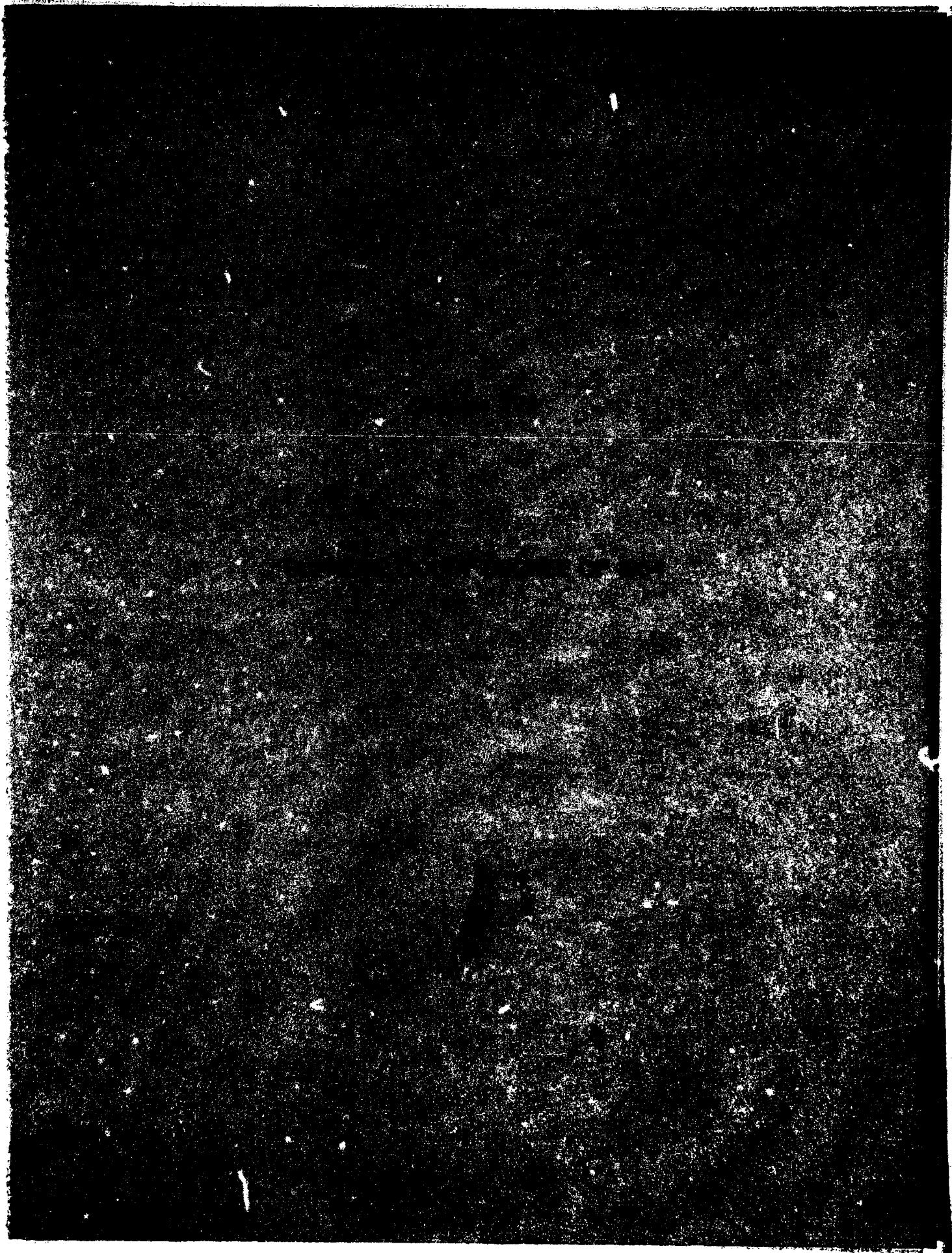
<u>Chapter</u>	<u>Title</u>	<u>Page</u>
XVII	SUPREME COURT DECREE OF 1954	XVII-1
A.	LEGAL APPRAISAL	XVII-1
1.	Principles of Adjudication	XVII-1
2.	Delaware River Interstate Litigation	XVII-10
3.	Role of Delaware River Basin Compact Relating to the 1954 Decree	XVII-18
B.	ATTITUDES OF AFFECTED STATES AND AGENCIES	XVII-28
C.	EVALUATION OF MODIFYING THE WATER REGIME OF THE 1954 DECREE	XVII-30
D.	OTHER CONSIDERATIONS	XVII-35
 XVIII	ALTERNATIVE NATIONAL RECREATION AREA	 XVII-1
A.	APPROACH	XVII-1
B.	DELAWARE WATER GAP NATIONAL RECREATION AREA (DWGNRA) WITH TOCKS ISLAND LAKE PROJECT (TILP)	XVII-3
1.	Analysis of DWGNRA with TILP	XVII-8
C.	ALTERNATIVE DWGNRA'S WITHOUT TILP	XVII-15
1.	Save the Delaware Coalition Plan	XVII-16
2.	Other Transportation Oriented DWGNRA Plans	XVII-19
3.	National Park Service Plan (NPS)	XVII-21
4.	Appalachian Mountain Club Plan	XVII-25
D.	POINTS OF COMPARISON AMONG ALTERNATIVE	XVII-31
1.	Alternative DWGNRA Visitation Levels and Facility Mixes	XVII-32
2.	Alternative DWGNRA's versus Comparable State and National Recreation Facilities	XVII-38
3.	Alternative DWGNRA Impacts on the Seven County Region	XVII-42
4.	TILP versus Non-TILP Recreation Standards	XVII-70
5.	Effects of Drawdown and Entrophication on the Quality of Recreation Experience	XVII-77
E.	PATRONAGE AT DWGNRA WITH AND WITHOUT TILP	XVII-80
1.	Market Demand	XVII-80
2.	Facilities Provided	XVII-85
3.	Rationing Techniques	XVII-87
4.	Programmed Activities	XVII-87
F.	BENEFITS AND COSTS	XVII-89
G.	SUMMARY	XVII-94

<u>Chapter</u>	<u>Title</u>	<u>Page</u>
XIX	PROJECT DEAUTHORIZATION	XIX-1
	A. DEAUTHORIZATION ISSUES	XIX-1
	B. LEGAL ANALYSIS OF DEAUTHORIZATION	XIX-5
	1. Legal and Institutional Steps to Accomplish Deauthorization	XIX-5
	2. Disposal of TILP Lands	XIX-6
	3. Effects on the Other Authorized Projects	XIX-7
	4. Legal Implications of the Walpack Bend Agreement Under Deauthorization	XIX-9
	C. GENERAL ANALYSIS OF THE DEAUTHORIZATION OPTIONS	XIX-13
	1. Deauthorization of Both DWGNRA and TILP	XIX-14
	2. Deauthorization of TILP with Continuation of DWGNRA	XIX-17
	D. IMPACTS OF DEAUTHORIZATION	
	1. Economic and Social Impacts of TILP Deauthorization	XIX-22
	2. Land Use Impacts of TILP Deauthorization	XIX-28
	3. Transportation Impacts of TILP Deauthorization	XIX-31
	4. Environmental Impacts	XIX-35
	5. Archeological and Historic Resources	XIX-36
	E. SUMMARY	XIX-37
XX	PROJECT DEFERRAL	XX-1
	A. LEGAL AND INSTITUTIONAL ASPECTS OF DEFERRAL	XX-2
	B. BENEFIT-COST IMPLICATIONS OF DEFERRAL	XX-4
	1. Institutional Options	XX-4
	2. Benefit-Cost Implications	XX-5
	3. Effect on Federal Interests	XX-10
	C. EFFECT ON DWGNRA	XX-10
	1. Land Acquisition and Maintenance	XX-10
	2. Relocation of Route 209	XX-11
	3. Facilities to be Provided	XX-12
	D. ECONOMIC AND SOCIAL IMPACTS	XX-14
	E. ENVIRONMENTAL IMPACTS	XX-16
	1. Additional Costs	XX-16
	2. Deferred Costs	XX-17
	3. Deferred Benefits	XX-18
XXI	EVALUATION OF INSTITUTIONAL ALTERNATIVES	XIX-1
	A. OVERALL FEASIBILITY OF FOREGOING INSTITUTIONAL ALTERNATIVES	XIX-2
	1. Supreme Court Decree of 1954	XIX-2
	2. Alternative National Recreation Area Plans	XIX-4
	3. Project Deauthorization	XIX-5
	4. Project Deferral	XIX-6

<u>Chapter</u>	<u>Title</u>	<u>Page</u>
XXI	B. INSTITUTIONAL ARRANGEMENTS AND CONSTRAINTS RELATING TO THE PROJECT'S AUTHORIZED PURPOSES	XXI-9
	1. Summary of Existing Institutional Arrangements and Constraints	XXI-10
	2. TILP/DWGNRA - Institutional Impacts	XXI-21
	C. EVALUATION OF OTHER INSTITUTIONAL CONSTRAINTS	XXI-27
	1. Water Quality	XXI-27
	2. Institutional Arrangements Required to Alter Pricing Patterns	XXI-32
	3. Institutional Factors of Mass Transportation	XXI-43
	D. SUMMARY: INSTITUTIONAL LINKAGES AND IMPLEMENTATION OF POLICY	XXI-50

## **FIGURE**

<u>Number</u>	<u>Title</u>	<u>Following Page</u>
XVIII-1	Delaware Water Gap National Recreation Area with TILP/Development Sub Areas	XVIII-3



## XVII.A. LEGAL APPRAISAL

### XVII.A.1. PRINCIPLES OF ADJUDICATION

As a preliminary matter, the principles which the Supreme Court has applied in adjudicating disputes between states over the waters of interstate streams are briefly reviewed below.

Aside from Federal legislation enacted under one or more of Congress' Constitutional powers, the Constitution prescribes two methods for resolving disputes between states: by interstate compact or by litigation.

Article I, §§ 10, cl. 3 permits compacts between or among states with the consent of Congress. Interstate compacts represent the adaptation to the Federal Union of the treaty making power of independent sovereign nations. Hinderlider v. La Plata River & Cherry Creek Ditch Co., 304 U.S. 92, 104 (1937).

Article III, §§ 2, cl. 2 vests in the Supreme Court original jurisdiction over controversies between states. Of this ground of original jurisdiction, the Court has explained that it serves as the means to resolve disputes which, if between independent nations, might be the subject of diplomatic adjustment, or of hostilities. North Dakota v. Minnesota, 263 U.S. 365, 373 (1923), Nebraska v. Wyoming, 325 U.S. 589, 608 (1945).

Not until the turn of this century was the Court faced with a dispute between states over water entitlements in an interstate stream. Kansas v. Colorado, 185 U.S. 125 (1902). At about the same time the complaint of a downstream state that an upstream state was polluting interstate waters also came before the Court. Missouri v. Illinois, 180 U.S. 208 (1901). In later stages of these cases, the Court laid down general principles which govern its approach to interstate water disputes, absent a compact or controlling Federal legislation.

One of these principles is equality of right as between the contending states. But this equality of right does not mean an equal division of the disputed waters between the protagonists. Far from it. It means that the Court is mindful that the dispute is between equals. Each state stands on the same level and the Court must recognize the equal rights of the contending states in a way that will establish justice between them. Kansas v. Colorado, 206 U.S. 46 (1907).

The other fundamental tenet is that the dispute "should be of serious magnitude, clearly and fully proved, and the principle to be applied should be one which the Court is prepared deliberately to maintain against all considerations on the other side." Missouri v. Illinois, 200 U.S. 496, 520 (1906).

The standard of proof and injury which a complaining state must meet for the Court to afford it equitable relief is higher and more exacting than

that which would prevail in a dispute of a similar nature between individuals. Missouri v. Illinois, supra, New York v. New Jersey, 256 U.S. 296 (1921), Connecticut v. Massachusetts, 282 U.S. 660 (1931), Colorado v. Kansas, 320 U.S. 383 (1943).

The high standard for relief reflects the Court's concern for the delicate issues of interstate relations such disputes invariably present as well as the Court's doubts concerning its ability to deal with the myriad and complex factual problems presented. West Virginia ex. rel. Dyer v. Sims, 341 U.S. 22 (1951).

In Colorado v. Kansas, supra, the Court (at 392) thus explained the reason for judicial restraint:

...while we have jurisdiction of such disputes, they involve the interests of quasi-sovereigns, present complicated and delicate questions, and, due to the possibility of future change of conditions, necessitate expert administration rather than judicial imposition of a hard and fast rule...(footnote omitted).

But the same concerns, once the Court is satisfied that it should arbitrate, have lead the Court to apply what Mr. Justice Holmes, in the Delaware River litigation, New Jersey v. New York, 283 U.S. 336, 342 (1931), described as a "more liberal answer" than might be the case when the Court is simply adjudicating a dispute between private parties within a

single state. For example, the Court will not be bound, even in cases involving eastern states, where that doctrine is embedded in state law, by principles of riparianism which preclude out-of-basin diversions of water. New Jersey v. New York, supra, Connecticut v. Massachusetts, supra.

In applying the foregoing tenets to litigation over rights to waters, the Court has forged what has come to be known as the doctrine of "equitable apportionment." New Jersey v. New York, supra. It is, as the term implies, an effort to do equity among the parties based upon the equal and quasi-sovereign nature of the parties, the degree of injury shown, relative needs, the existing factual, legal and institutional situation in each state, and similar considerations.

In resolving such complex and delicate issues, the Court will apply federal, state and international law as the exigencies of the particular case may require. Connecticut v. Massachusetts, supra. While it will take local law, such as the doctrine of prior appropriation which prevails in the arid western states and riparianism, more or less prevalent in the east, into account, such local law will seldom be the controlling factor. Connecticut v. Massachusetts, supra, Illinois v. City of Milwaukee, 406 U.S. 91 (1972), Nebraska v. Wyoming, supra, but compare Wyoming v. Colorado, 259 U.S. 419, 489 (1922). The body of precedent which the Court has developed in forging the equitable apportionment doctrine was early described as "interstate common law." Kansas v. Colorado, supra, at 98.

In applying the doctrine, certain specific concepts of particular relevance

to the Delaware River Basin have emerged. Among them:

(1) The state claiming injury must show serious actual or impending injury to her substantial interests. The Court will not adjudicate a hypothetical dispute. Missouri v. Illinois, supra, New York v. New Jersey, supra, Connecticut v. Massachusetts, supra, Arizona v. California, 283 U.S. 423 (1931), Colorado v. Kansas, supra, Nebraska v. Wyoming, supra.

(2) An upper state may not claim, nor may a lower state demand, the entire flow. Each state riparian to an interstate stream must be assured water. Kansas v. Colorado, supra, Wyoming v. Colorado, supra, Connecticut v. Massachusetts, supra, New Jersey v. New York, supra, Hinderlider v. La Plata River & Cherry Creek Ditch Co., supra. However, in weighing the equities, existing uses of clearly demonstrable need in one state will not be displaced to allow for speculative future possibilities in the complaining state, or for what might have occurred in the complaining state had not uses developed in the other state. Kansas v. Colorado, supra, Wyoming v. Colorado, supra, Connecticut v. Massachusetts, supra, New Jersey v. New York, supra, Nebraska v. Wyoming, supra, Colorado v. Kansas, supra.

In practice, more often than not, the complaining states in interstate water litigation have, accordingly, been either unsuccessful, or at best, only partially successful in seeking relief, but the Court has usually left the door open for another look should circumstances change. This is at times accomplished by denying relief but without prejudice to the

reinstitution of the litigation at some future date in the event of a change of conditions, e.g., Kansas v. Colorado, supra, at 118, or as was done in the Delaware River case, New Jersey v. New York, supra, where a decree of apportionment had been entered, by providing specifically that either party may apply "at the foot of this decree," i.e., at some future time, for other or further action or relief, with retention by the Court of jurisdiction over the case for purposes of further action as appropriate. 283 U.S. at 348 (the 1931 decree).

(3) The Court has consistently declined to require that a diverting state restrict its diversions to uses within the watershed of the stream whose waters are being apportioned. Wyoming v. Colorado, supra, Connecticut v. Massachusetts, supra, New Jersey v. New York, supra.

(4) The contending states appear as *parens patriæ*, representing all their citizens, and the decree of the Court binds them. Wyoming v. Colorado, 286 U.S. 494 (1932), New Jersey v. New York, 345 U.S. 369 (1953), Hinderlider v. La Plata River & Cherry Creek Ditch Co., supra.

It has become customary practice for the Supreme Court to provide specifically for the reopening of decrees it enters in interstate water litigation. The 1954 decree which is currently in force in the Delaware River litigation provides in that respect as follows:

X. Retention of Jurisdiction; No Estoppel. Any of the parties hereto, complainant, defendants or intervenors, may apply at the foot of this decree for

other or further action or relief, and this Court retains jurisdiction of the suit for the purpose of any order or direction or modification of this decree, or an [sic] supplemental decree that it may deem at any time to be proper in relation to the subject matter in controversy. The fact that a party to this cause has not filed exceptions to the report of the Special Master or to the provisions of this decree shall not estop such party at any time in the future from applying for a modification of the provisions of this decree, notwithstanding any action taken by any party under the terms of this decree.

New Jersey v. New York, 347 U.S. 995, 1005 (1954)

Such provisions reflect the fact that needs, uses and physical and demographic conditions do not remain static and that experience under a decree may well demonstrate that what was theoretically a just and equitable solution may not in actual practice fulfill the expectation of its framers. "[T]he possible experiences of the future may make modifications of the plan as it now stands necessary in unforeseen particulars." New Jersey v. New York, 283 U.S. 336, 348 (1931).

No case has actually come before the Court in which a complaining state has petitioned for a reopening of a decree theretofore entered by the Court for the purpose of reducing a diversion right either decreed by the

Court in the earlier litigation or which the Court in that litigation had refused to enjoin. Nor, where the Court has specifically provided in the decree that jurisdiction was retained for the purpose of considering future modifications, does it appear that any state has sought to reopen a decree to reduce a diversion by another state decreed in the earlier litigation or which the Court had refused to enjoin in such earlier litigation.

The closest the Court has come to such situations was Colorado v. Kansas, 320 U.S. 383 (1943). There, some three and one-half decades after the Court's decision in Kansas v. Colorado, 206 U.S. 46 (1907), Kansas asserted that Colorado had increased diversions over the level obtaining at the time of the earlier case; diversions which the Court had at that time refused to enjoin. Again the Court refused to grant Kansas any relief, holding that, as was the case originally, Kansas had not sustained the heavy burden of proof required.

In Colorado v. Kansas, the Court specifically denied Colorado's argument that its 1907 decision, refusing to enjoin Colorado's then level of diversion, amounted to an allocation between the two states of the flow of the river involved. The Court disposed of this argument by pointing out that the dismissal of Kansas' complaint was the result of Kansas' failure to meet the high burden of proof applicable in litigation between states. The Court added, however, that "... from the decision then rendered it follows that unless Kansas can show a present situation materially different from that disclosed in the earlier case she cannot now obtain

relief." 320 U.S. at 391.

There is little reason to conclude, therefore, that were the Court to be presented with a case in which the complaining state seeks to reduce a diversion by another state which the Court had earlier allowed or refused to enjoin, the Court would relax the high barriers to relief which are discussed earlier herein. The Court could not be expected to approach the case as though the parties were before it for the first time, writing on a fresh slate. And even were that to be the situation, the test of Missouri v. Illinois, supra, would have to be met.

Not surprisingly, the Court's misgivings about its suitability as an arbiter in interstate disputes involving water as well as other matters, have prompted it on more than one occasion to remind the protagonists, albeit at times with considerable diffidence, of the fact that the Constitution does, after all, provide for interstate compacts. Washington v. Oregon, 214 U.S. 205, 217 (1909), Wisconsin v. Illinois, 252 U.S. 273, 283 (1920), New York v. New Jersey, 256 U.S. 296, 314 (1921), Colorado v. Kansas, 320 U.S. 383, 392 (1943), Nebraska v. Wyoming, 325 U.S. 589, 616 (1945). See, also, Hinderlider v. La Plata River & Cherry Creek Ditch Co., 304 U.S. 92, 104-106 (1938), West Virginia ex rel. Dyer v. Sims, 341 U.S. 22, 27 (1951).

But despite the Court's entreaties, no interstate water compacts were entered into until 1922, these being the La Plata and Colorado River compacts.

Where an interstate compact allocates water between state, the apportionment is binding on all citizens and all water claimants in the states involved just as would have been the case were the apportionment or allocation to have been decided by the Court in a litigated controversy.

Hinderlider v. La Plata River & Cherry Creek Ditch Co., supra. And, finally, a compact having been entered into, it cannot unilaterally be nullified (unless its terms so permit) or be given final meaning by one of the parties. In the event of a dispute, the nature and scope of the obligations entered into are to be determined by the Supreme Court and, while the Court will give deference to interpretations by its own highest court of a state's law and policy, the Court is free to make its own determinations with respect thereto. West Virginia ex. rel. Dyer v. Sims, supra.

#### XVII.A.2. DELAWARE RIVER INTERSTATE LITIGATION

##### XVII.A.2(a) Historical Background of Supreme Court Decrees

Much of the pressure which has triggered the complicated and continuing dispute over apportionment of the Delaware River's waters has been stimulated by the decision of the City of New York to look to the Delaware River, rather than the Hudson, for water and the conflict engendered thereby with downstream users, such as Philadelphia and Northern New Jersey. Increasing industrialization and urbanization along the Delaware and its tributaries led to significant increases in pollution of those waters; that problem as much as, or more than, limitations on the available quantity of water in the basin, led to the increasing concern of local and

state governments in the 1920's with the distribution of basin waters.

A number of studies of existing and potential new sources of water were commissioned by basin area governments. New York, New Jersey and Pennsylvania looked with increasing urgency toward the upper basin area as a critical source of future water supply for all three states.

In 1924, the three states appointed representatives to devise a plan for allocation of the Delaware's waters through some form of interstate agreement or compact. Just two years before, the Colorado River Compact had been executed as the first major multi-state water allocation agreement. Both Pennsylvania and New Jersey found the initial recommendations of the negotiators to be unacceptable, and discussions continued. The second set of proposals met with little more success in those two states. Throughout this period, the urgency of New York City's decision to go to the Delaware Basin for water was intensifying, and New York State was strongly in favor of the negotiated allocations mentioned above.

Frustrated by the seeming impossibility of negotiated settlement, New York City and State proceeded with their own plans for out-of-basin diversion of the waters of the Upper Delaware River. In May 1929, New York State approved the plans of the City Government for diversion of waters of the Upper Delaware, and in the same month the State of New Jersey sued the State and City of New York, invoking the original jurisdiction of the United States Supreme Court. The Commonwealth of Pennsylvania subsequently intervened. New Jersey v. New York, 280 U.S. 582 (1930). The ensuing

decision (283 U.S. 336, [1931]) is a good example of the way in which the Supreme Court has generally faced up to interstate water disputes, as is discussed more fully above. New Jersey asked the Court to enjoin New York from making any diversions from the Delaware or its tributaries. The Court, speaking through Mr. Justice Holmes, kept two basic principles in mind in settling the dispute. First, it emphasized its necessary role as an arbiter of competing, but equally compelling, interests on all sides of the dispute. Said Mr. Justice Holmes with characteristic eloquence and succinctness:

A river is more than an amenity, it is a treasure.  
It offers a necessity of life that must be rationed among those who have power over it. New York has the physical power to cut off all the water within its jurisdiction. But clearly the exercise of such a power to the destruction of the interest of lower States could not be tolerated. And on the other hand equally little could New Jersey be permitted to require New York to give up its power altogether  
\*\*\* Both States have real and substantial interests in the River that must be reconciled as best they may be.

283 U.S. at 342-43.

This is the doctrine of equitable apportionment discussed above, and it lies at the heart of the Court's attempt to provide fairly for uses of the river's waters in its decree. Flowing directly from this concept is a

corollary. Adjustment of competing interests will necessarily be affected by changed circumstances - increasing or decreasing population, meteorological conditions, deteriorating water quality, new public works or the abandonment of old ones, demands for more recreation opportunities, technological innovation, and events or problems unimaginable at the time the decree was entered.

Realizing this, the Court left an escape hatch at the end of its decree. On the one hand the Court bound the hands of the parties in a precise, quantifiable manner. On the other hand, it left the way open for the parties to seek to untie these fetters should circumstances change enough to warrant it. However, as indicated in the above text, it should not be assumed, were the matter actually to arise, that changes would be lightly approved, absent agreement among the parties as was the case with the 1954 decree.

The 1931 decree will not be discussed in great detail here since its provisions were superseded by the provisions of the 1954 decree, which is discussed below.

Suffice it to say that the basic thrust of the 1931 decree gave New York City permission to divert a fixed maximum quantity of water per day, ordered specific sewage treatment measures to be taken at Port Jervis, and instructed the city to release waters from its impounding reservoirs when and if the Delaware flow should fall below certain levels, as measured at specific points along the river.

The Court also held that the diversion allowed to New York should not constitute a "prior appropriation," i.e., judicial permission to divert in 1931 could not in the future be asserted by New York as a superior priority to other interested riparian owners under the traditional appropriation theory of western state water law, which holds that "first in time is first in right," or in other words, whoever takes and uses water first has a claim superior to that of later diverters in the event of shortage. See, e.g., Wyoming v. Colorado, 259 U.S. 419, 458-465 (1922). Pennsylvania was denied its requested allocation, and its request that a river master be appointed was likewise denied.

As adverted to above, the Court further provided than any party to the litigation could come in later and apply for a modification of the decree's terms. Finally, the Court ruled that the decree was without prejudice to the paramount rights of the United States, and specifically referred in this context to the dominant powers over navigation of the Chief of Engineers. Mr. Justice Holmes noted, in both contexts, that "... New York takes the risks of the future." (283 U.S. at 344.)

The 1931 decree partially settled the immediate problems and gave the parties, particularly New York, a specific quantified idea of what would be permitted in terms of diversions from the basin. But it did little to resolve the problems of future planning, control and allocation of the Delaware's waters for the many purposes to which all states would want to put them. Realizing this, the states attempted during the 1930's and 1940's again to reach some voluntary agreement on allocation of the waters

and planning for the basin. Agreement seemed promising among some of the parties, but not among all, and by the early 1950's New York City again was pressing what it considered to be its urgent needs for more Delaware Basin water than that available under the explicit limitations of the 1931 Supreme Court decree. The city petitioned the Supreme Court on April 1, 1952 to amend the 1931 decree. New York State, New Jersey, Pennsylvania, and Delaware were all parties or intervenors in the second case. Philadelphia's attempted intervention, however, was rejected. New Jersey v. New York, 345 U.S. 369 (1953).

The Special Master whom the Court appointed to hear the case was convinced from the beginning that a negotiated settlement was the best way to resolve the renewed dispute. He wished to present the Court with a proposed decree to which none of the parties would file exceptions, and he essentially got his wish. The parties were able to agree to most of the provisions of what was to become the 1954 Supreme Court decree. New Jersey v. New York, 347 U.S. 995 (1954).

#### XXVII.A.2(b) Provisions of the 1954 Decree

All provisions of the 1931 decree were superseded. New York City was permitted to continue the 440 MGD diversion allowed in the 1931 decree until it completed and placed in operation a reservoir it was then constructing on the East Branch of the Delaware River. Once that reservoir was completed, and a second one at Cannonsville (on the West Branch) was finished, New York could divert 800 MGD. That diversion continues to be New York's basic allocation.

As a condition to availing itself of that diversion, New York was obliged to make certain compensating releases from its reservoirs in accordance with the so-called "Montague Formula." The formula provides that releases be made in such quantities that a minimum rate of flow of 1750 cfs (measured at Montague, New Jersey) would be maintained in the river after completion of the Cannonsville Reservoir. In addition, certain excess releases (over and above the 1750 cfs just mentioned) would be required of New York to be computed as a percentage of the excess water supply available to the city after it deducted what it would need to maintain a continuous safe supply of water to satisfy its needs. Provision was also made for further treatment by New York of effluent from its sewage treatment facilities at Port Jervis. New Jersey was authorized to make out-of-basin diversions in the amount of 100 MGD, without any compensating releases being required.

The Court appointed a River Master to supervise the provisions of the 1954 decree, and it again asserted that diversions authorized by the Court did not constitute prior appropriations of the waters of the Delaware. The paramount authority of the United States over the river "... in respect to commerce on navigable waters of the United States ..." was also reasserted and the Court retained jurisdiction of the controversy for purposes of future modification of the decree should changed circumstances so require. It was also provided that failure to file objections to the Special Master's report (which report the Court adopted) would not stop any party from applying for a future modification of the decree.

With the exception of the drought emergency declared by the Delaware River Basin Commission during the mid-1960's (discussed in more detail below), the provisions of the 1954 decree have been the basic blueprint for allocating the waters of the Delaware River to the present day. The River Master is the administering agent of the 1954 decree and is instructed in the decree to monitor compliance with its provisions.

XVII.A.2(c) Reopening of the 1954 Decree

As noted above, the Supreme Court clearly intended that any party to the Delaware River litigation was to be able to petition the Court to re-open the decree. Were it not for the execution of the Delaware River Basin Compact in 1961, those parties would still be free to go back to the Court as New York did in 1954. Discussion of that theoretical possibility is now pointless, however, because the execution of the Compact in 1961 included a bartering away of the right of any of the states party to the compact (New York, New Jersey, Pennsylvania and Delaware) or of their political subdivisions (e.g., New York City) to go back to the Court on its own for the life of the compact (a minimum of 100 years) except for very limited purposes, as discussed herein. (Compact, § 3.4.)

The Supreme Court has held that a state may not read herself out of a compact which she has ratified, and to which the United States Congress has consented, West Virginia ex. rel. Dyer v. Sims, 341 U.S. 22 (1951), so there is no question that all parties to the Delaware River Basin Compact are bound by their agreement not to return to the Supreme Court unilaterally to try to re-open the 1954 decree. In addition, as pointed

out earlier, the Court has repeatedly expressed its preference for resolution of interstate disputes, such as the Delaware River controversy, by compact rather than through litigation. Thus, we must look to the Delaware River Basin Compact as the controlling mechanism for modifying the provisions embodied in the 1954 decree.

#### XVII.A.3. ROLE OF DRBC RELATING TO THE 1954 DECREE

##### XVII.A.3(a) Enforcement of and Modification to the Decree

The Delaware River Basin Compact, unique in the sense that the United States is a party to the compact in addition to Congress having consented to the states' participation therein, was approved by the United States, New York, New Jersey, Pennsylvania and Delaware in 1961 (P.L. 87-328, 75 Stat. 688; New York Laws of 1961, Chapter 148; New Jersey Laws of 1961, Chapter 13; Pennsylvania Acts of 1961, Act No. 268; 53 Delaware Laws, Chapter 71). Section 3.5 of the compact says, in pertinent part, that:

[E]xcept as specifically provided in Sections 3.3  
and 3.4 of this article, nothing in this compact  
shall be construed in any way to impair, diminish or  
otherwise adversely affect the rights, power, pri-  
vileges, conditions and obligations contained in the  
[1954] decree \*\*\*

Section 3.3 of the compact provides that the DRBC may allocate the waters of the Delaware River Basin among the signatory states, in accordance with

the doctrine of equitable apportionment. This provision standing alone would have clothed the Delaware River Basin Commission (hereinafter the DRBC) with power to alter the amounts or timing of existing diversions or compensating releases set forth in the 1954 decree. However, there is a critical proviso in Section 3.3 which directs that:

The commission, without the unanimous consent of the parties to the \*\*\* [1954] decree \*\*\* shall not impair, diminish or otherwise adversely affect the diversions, compensating releases, rights, conditions, obligations, and provisions for the administration thereof as provided in said decree \*\*\* (emphasis added)

The DRBC, then, could theoretically increase permitted diversions to one or another signatory state without the unanimous consent of the signatory states, but since such an increase is, in practical terms, almost certain to "adversely affect" another state's interests and rights under the 1954 decree, the Commission is for all intents and purposes bound to a need for unanimity among all the signatory states to the compact and, in addition, the City of New York, for it is a party to the 1954 decree, if the releases and diversions specified in the decree are to be changed in any significant way. It should be emphasized here that with unanimity the DRBC can effect changes in the releases and other rights and conditions provided for under the terms of the 1954 decree on its own, without first returning to the Supreme Court.

If it does act unanimously to alter the regime provided for under the

1954 decree, and thereby effectively amends the terms of the compact with respect to the decree, any of the signatory parties may prosecute an action in the Supreme Court to appropriately amend the decree and to enforce the provisions of the amendment, if such amendment increases diversions or compensating releases. (DRBC Compact, § 3.4.) If, for example, all the parties agreed that New York's diversion should be increased to 900 MGD and that certain adjustments should be made in New York's compensating releases, any of the four states could go back to the Court for a modification of the decree and for injunctive or mandatory relief to enforce the amended terms.

In addition, any party to the compact may go back to the Court to enforce the provisions of paragraph III.B.3. of the 1954 decree, which deals with the obligation of New York to continue its release despite some future change in the configuration of the river's flow, or of paragraph V.B. of the decree, which deals with New Jersey's permitted diversion and requirements for construction of certain public works by New Jersey.

Finally, a seeming anomaly arising out of the "exception" clause in Section 3.4 of the compact must be discussed. Section 3.4, as already observed, excepts from the waiver of rights to return to the Supreme Court in respect of the 1954 decree, a proceeding to modify the decree to increase diversions or compensating releases in connection with such increased diversions. But what if, under the emergency powers conferred by Section 3.3(a) of the compact, the DRBC orders a decreased diversion, and the diverter refuses to comply with the order?

Read literally, §§ 3.4 of the compact would appear to preclude an attempt to invoke the Supreme Court's jurisdiction in such a case. Probably, if confronted with such a situation, the Commission itself would seek to proceed in the appropriate United States District Court by invoking the jurisdictional provisions of Section 15(p) of the compact, which vests United States district courts with "original jurisdiction of all cases or controversies arising under the compact" and under the Act of Congress (P.L. 87-328, 75 Stat. 688) by which Congress consented to the compact and made the United States a party thereto. But there remains at least a theoretical possibility that the Commission might not seek to invoke the jurisdiction of the federal district court and that one or more of the parties to the 1954 decree might seek to invoke the Supreme Court's jurisdiction.

In such a case it would seem that a question of interpretation of the compact would be presented, which, under the doctrine of Hinderlider v. La Plata River & Cherry Creek Ditch Co., 304 U.S. 92 (1938) and West Virginia ex. rel. Dyer v. Sims, 341 U.S. 22 (1951), could be presented to the Supreme Court, despite the literal language of the "exception clause" of Section 3.4.

However, Illinois v. City of Milwaukee, 406 U.S. 91 (1972) suggests that the Court might well be reluctant to entertain such a proceeding because of Section 15(p)'s jurisdictional grant to the federal district courts.

Only in the four circumstances outlined above, then, can an individual

state go to the Supreme Court with respect to the provisions of the 1954 decree or with respect to amendments thereto effectuated by the Commission.

To summarize, those four circumstances are:

1. When one of the four signatory states sees a need for judicial compulsion to enforce the terms of unanimously-agreed-to changes in the diversions, releases or other matters covered in the decree involving increased diversions or compensating releases, and perhaps also when the agreement requires decreased diversions.
2. When one of the four signatory states sees a need for judicial compulsion to enforce the terms of paragraph III.B.3. of the 1954 decree.
3. When one of the four signatory states sees a need for judicial compulsion to enforce the terms of paragraph V.B. of the 1954 decree.
4. When one of the four signatory states sees a need for judicial compulsion to enforce an order of the DRBC after declaration of an emergency changing diversions or releases from those provided by the decree and when such changes involve increased diversions or compensating releases, and perhaps, when they involve decreases as well.

There are no other circumstances under which one of the signatory states may go back to the Supreme Court concerning the 1954 decree during the

duration of the compact, because in Section 3.4 of the compact it was agreed that:

[e]ach of the signatory states and their respective political subdivisions, in consideration of like action by the others, and in recognition of reciprocal benefits, hereby waives and relinquishes for the duration of this compact any right, privilege or power it may have to apply for any modification of the terms of the [1954] decree \*\*\* except [in the circumstances outlined above] \*\*\*

It may be seen by now that in a very real sense the 1954 decree is nearly locked in concrete by the 1961 compact. A state may go to the Supreme Court only to enforce the terms of a change already unanimously agreed to under the compact or to enforce the status quo of the two provisions of the decree referenced above.

Although both the Supreme Court (347 U.S. at 1004) and the compact (Section 3.3[b]) deny any such implication, the compact has had the effect of converting the permitted diversions which the 1954 decree (paragraph VIII) specifically stated are not to constitute either "prior appropriations" or "apportionments" into just such categories for the compact's duration, subject, of course, to the compensating releases required by the decree and to the Commission's emergency powers.

This subsection has focused on the difficulties of going back to the

Supreme Court to re-open or modify the provisions of the 1954 decree. It should be emphasized that Sections 3.3 and 3.4 of the compact in no way prevent an individual state or party to the Supreme Court action which resulted in the 1954 decree from going to court to enforce the existing provisions of the 1954 decree.

XVII.A.3(b) DRBC's Emergency Powers - the 1960's Drought

Section 3.3. of the Compact authorizes the DRBC, after consultation with the River Master appointed under the 1954 decree, to:

\*\*\* find and declare a state of emergency resulting  
from a drought or catastrophe \*\*\*

If, after declaring such an emergency, the Commission wishes to increase or decrease any allocations or diversions permitted or releases required by the decree, the DRBC must obtain the unanimous consent of its members (this would include the United States representative, as well as the four states). Once an emergency is declared, and changes in the terms of the decree are properly effectuated, the emergency situation may be maintained "... for such limited time as may be necessary to meet such an emergency...." The compact would seem, at first glance, to have defined the term "emergency" with some specificity by limiting its invocation to times of "drought or catastrophe." However, although the word "drought" may be a fairly quantifiable term with apparently straightforward, objective characteristics, the meaning of the word "catastrophe" is not so easily fixed.

Under Section 14.2 of the compact the Commission may "[m]ake and enforce reasonable rules and regulations for the effectuation, application and enforcement of [the] compact \*\*\*" Clearly, this includes the power to define the words "drought" and "catastrophe." The power to define those terms invests the DRBC with significant discretion to utilize the full potential of the emergency power through the imaginative defining of what constitutes a drought or catastrophe. Regulations are, of course, subject to a rule of reason and must adhere to the intent of the provisions of the compact which they effectuate.

In addition, once the Commission has declared an emergency it still needs the unanimous consent of its members to alter the terms of the decree. There are, therefore, both legal and political restraints on the DRBC in exercising the above-described regulatory powers. But there is no reason why the Commission need limit itself to narrow or overly-literal interpretations of the language of the compact, if it can achieve the unanimity which, as a practical matter, is required for the definition of the terms and for declarations of emergency as well as for the issuance of orders for releases or diversions in an emergency. For it may be doubted that a state would agree to an emergency order if dissatisfied with the definition of "catastrophe" or "drought."

The 1960's drought confronted the DRBC with its first opportunity to test its responsive powers in emergency circumstances. No one seriously questioned the fact that the basin area was suffering drought conditions. The difficult problem was to mold a unanimously acceptable solution to what

everyone knew was an emergency. The detailed events of that period have been recorded extensively in the literature and need not be repeated here. What essentially happened was that the DRBC was able to piece together an acceptable compromise by obtaining the cooperation of the compact members (including the United States, primarily through the Corps of Engineers and the Department of the Interior) and private power companies with significant nearby storage capacity. No one went back to the Supreme Court, although that suggestion was made, and the drought period was survived though not without a considerable degree of touch-and-go while the emergency lasted.

Most importantly, the emergency powers were proven to be viable; in fact there may be parties to the compact who feel that since they made it through the 60's on the emergency powers, it can always be done again. This attitude would encourage the conclusion that the decree ought to be left as is, only to be temporarily superseded by emergency orders at times of crisis, an approach which is understandable when it comes from a state which has decided that it might be a substantial loser if a permanent alteration of the decree takes place.

It would be technologically possible and legally permissible, in our view, for the members of the compact to agree to something other than a one-dimensional change in the decree by unanimous consent. There is no legal impediment to the Commission adopting a schedule of variable circumstances which, when fed through a computer, would lead to a theoretically limitless set of scenarios for the manipulation of diversions and releases

in the basin. If the members would unanimously consent to such a constantly varying schedule of operating variables (subject, of course, to DRBC modification in the future, and subject to judicial enforcement action by a party who alleged non-compliance with the terms of the schedule), a greater degree of long-term predictability and automaticity might be injected into basin management.

There are, however, obvious political impediments to the institution of such a system, the term "political" being used not in a partisan sense, but in the sense of the interplay of relationships between the parties to the decree and the compact. It is not feasible in a legal analysis to weigh all the variables of the complex workings of such relationships, but the parties to the compact might not be prepared to tie themselves to the kind of long-range commitments involved in a system such as the one just described. If an automatic system were adopted, each party would lose, or appear to lose, future leverage and flexibility in the occasions for bargaining available under Section 3.3(a) of the compact.

## XVII.B. ATTITUDES OF AFFECTED STATES AND AGENCIES

The Consultant's understanding of the overall position of the affected states and the Delaware River Basin Commission staff with respect to the water diversion and release requirements stemming from the 1954 Supreme Court Decree is that, in general, there is no desire to re-open the decree or formally alter diversion or release requirements derived from its provisions unless the specific purpose and end results of these changes are clearly defined in advance and found to be acceptable by all parties. There is no evidence that any states or agencies are now considering measures to re-open the decree.

A major concern affecting the attitudes of New York City, and thus the state of which it is a governmental unit, is the continuance of the diversions authorized by the decree and compact. Based upon these, substantial investments have been made and long-range plans have been formulated and put into execution.

Concerns of the State of New Jersey are related to the amount and reliability of its future water supply and to the rate and character of regional growth and development. The latter point is significantly influenced by the availability, adequacy and type of water supply sources utilized.

Pennsylvania's concerns focus primarily on the need for an assured, adequate future supply of water, and those of Delaware center on the need to

maintain the presently prescribed Trenton flows and hence not further impair the estuarine conditions. Delaware does view river flow problems as more the concern of the other three basin states, but would oppose additional withdrawals.

### XVII.C. EVALUATION OF MODIFYING THE WATER REGIME OF THE 1954 DECREE

The provisions of the 1954 Supreme Court Decree establish a water regime which relates primarily to the diversion and release of Delaware River waters and thus to water supply resources available to various users. By "water regime" is meant the diversions, compensating releases, conditions, obligations and provisions for administration thereof as provided in the decree. The modification of the regime provided by the decree or the modification of the compact in and of itself, however, are not of direct significance. The practical effects of modifying the water regime of the decree turn upon the ways in which the requirements for altering that regime govern, limit or influence alternative water diversions and releases, alternative water supply methods, and the future use of water resources.

As noted in the foregoing "Legal Appraisal", the states involved, for themselves and their political subdivisions, have waived their right to seek a reopening of the decree, except for limited purposes. The power of the DRBC to equitably apportion the waters of the Delaware River Basin is circumscribed by the express limitation that without the unanimous consent of the parties to the 1954 decree (which includes New York City as well as the states), the decree provisions may not be impaired, diminished or otherwise affected. Hence, the overriding requirement for effectively altering the water regime of the decree is that the four concerned states and the City of New York unanimously agree on the course and measures to be under-

taken. Each state and the City of New York must, therefore, perceive the contemplated changes, or implications following from the changes, as advantageous (or, at the least, not inimical) to its financial, political and other positions and interests. The need to modify the water regime of the decree and the desirable effects of such modification upon categories of possible water supply alternatives to the Tocks Island Lake Project are addressed below. These alternatives are analyzed in detail in Chapter XII.

The implementation of the Tocks Island Lake Project itself is not dependent upon the modification of the water regime of the 1954 decree or upon the modification of the Delaware River Basin Compact. However, since the construction of the TILP would fundamentally alter the flow characteristics upon which the regime of the decree and the compact were based, particularly during periods of low flow or water scarcity, it does appear most appropriate that the decreed regime be reviewed by all concerned parties and that modified provisions reflecting hydraulic characteristics of the river after TILP's construction (if the project is found to be desirable and is scheduled to be built) be developed and unanimously adopted.

One water supply alternative to TILP is to do nothing. Assessments of recurrence intervals of conditions of scarcity, associated damages and hardships, contingency measures and costs, anticipated pertinent technological advances, and changes in environmental and other values may show this alternative to possess merit. Chapters III, VI and XII discuss these and related factors in detail. It is, of course, not necessary to modify

the decree provisions to follow this alternative.

There is a range of temporary measures which constitute water supply alternatives to the Tocks Island project. These include schemes whereby additional water could be introduced into the New York City system, thereby freeing additional releases to be made down the Delaware, or diverted into the Delaware directly so that upstream diversions could continue to be made to New York City. Examples of these are the provision of standby pumping capacity from the Hudson River; the importation of water to New York City by means of standby, or some other form of saltwater conversion, or groundwater utilization; the importation into the Delaware system of flow from other basins, thereby increasing the short-term flow rate at Trenton and maintaining protection against the saline frontier; the temporary employment of desalinization equipment in the basin; and the installation of temporary water withdrawal equipment upstream of Torresdale. Chapters III and XII outline these and other possible temporary measures in detail.

Temporary measures undertaken in response to emergency conditions are, as noted previously, taken into account in the compact document. It permits the DRBC, after consultation with the River Master, to "find and declare a state of emergency" but then requires unanimous consent of its members to temporarily alter the diversions permitted or releases required by the decree. In this connection, it should be noted that the United States is a member of the DRBC as are the four states. The City of New York is not a member.

As illustrated by the emergency measures employed during the drought of the 1960's, the present arrangements did permit such temporary measures to eventually be developed and employed. Thus, there is no clear evidence indicating that the decree regime should be modified to meet future emergency conditions. However, should a future emergency be less evident or affect the concerned parties in differing degrees or fashions than in the 1960's, there is no certainty whatsoever that emergency measures could be arrived at which would receive the necessary unanimous consent required for their implementation.

It is, therefore, highly desirable that the DRBC explore the possibility of developing a range of contingency plans to which prior approval, in principle as a minimum, might be obtained from all concerned parties. The revision of the compact to include binding arbitration if unanimous consent cannot be obtained to carry out emergency measures should also be considered. Obviously, both these suggestions present a range of practical, though not insurmountable, difficulties.

Structural or physical water supply alternatives to TILP include the utilization of groundwater, surface-ground conjunctive use, out-of-basin sources, recycling of water, tributary reservoirs and high flow skimming. These and other structural alternatives do not necessarily require the modification of the water regime of the decree or of compact provisions as they generally increase the overall amount of water available and do not reduce that destined to any of the users. Further, the costs would usually be largely borne by those benefitting.

However, considering the total water resources available to basin users as a resource to which all have a rightful claim, the exploitation of a major new source by one user should not be done unilaterally but in the context of basin-wide planning, appropriate cost-sharing and, most significantly, considering the possible reallocation of other water sources to maintain an equitable basis of distribution.

Nonstructural water supply alternatives to TILP include modified pricing policies, rationing and insurance-type procedures which could levy charges in trouble-free years to cover the cost of contingency operations and the temporary use of higher cost sources during periods of water scarcity. These and other nonstructural water supply alternatives are fully discussed and evaluated in Chapter XII.

Unlike the structural alternatives, most of these measures will not yield more water for basin users than presently allocated. The modification of the water regime of the decree or compact provisions regarding allocations, diversions and releases thus does not appear necessary. The expansion of DRBC or another basin-wide agency's responsibilities to administer a non-structural water supply alternative may be required should such an alternative prove to be feasible.

#### XVII.D. OTHER CONSIDERATIONS

The evaluation of the modification of the water regime of the 1954 Supreme Court Decree, as noted previously, is dependent upon the details of the specific feasible and desirable alternative(s) which become attainable as a result of the modification. Section XVII.C. outlines the types of alternatives dependent upon modification of the decreed water regime and compact provisions and new approaches to be considered in the development of water supply measures.

The effect of river flow variations, such as those which could be caused by modified diversions and releases is analyzed in Chapter III, "Water Supply." The location of the saline front under various conditions is a prime factor in that element of the study. Other factors affecting or governing low flow requirements and the need for low flow augmentation are covered in Chapter VI, "Water Quality Considerations," Chapter IX, "Water Quality Effects of the Tocks Island Lake Project," and Chapters XII and XVI concerning water supply alternatives.

Another consideration referred to in Section XVII.C. relates to preparation of equitable contingency plans in advance of periods of drought or water scarcity and obtaining approvals for the courses of action they describe. This would involve identification of proportional reductions in demand based upon experience gleaned from the drought of the 1960's, and reflective of some standard of equity or fairness which might be

decided before the heat of battle. This could be alternative sets of operating rules which would represent the optimal decisions to be taken under various actual conditions of scarcity.

Specifications which describe results to be achieved in terms of performance oriented criteria are important to preparation of equitable contingency plans. Such sets of criteria could, for example, be adaptive allocation rules which encompass a formulation tending to optimize water allocations during periods of scarcity. The criteria and rules would define "emergency" specifically, and they would provide for levels of system failure whose cost and discomfort can be borne with adequate prior evaluation and planning. As a subject for future study, and possibly for eventual use if found to be feasible, the alteration of the compact's release and diversion provisions based upon mathematical analysis, particularly optimization procedures, should be investigated. These have become commonplace and popular since the mid-1950's, at which time computing machines began to be generally available.

The effect of the decree was to assume a linear economic cost function with respect to optimal operation of the resource system. That is, it effectively assumed a kind of direct proportionality between water availability (or non-availability) and overall gains or losses to parts of the region by only defining release and diversion provisions at the infrequently realized extremes of possible flow conditions. It is virtually certain that this simple function does not reflect realistic economic and social relationships, and since the decree addresses extreme or pos-

sibly future extreme conditions primarily, the equitable or optimal allocations of moderately reduced water supply resources is not directed by the decree and consequent hardships may be inequitably distributed. The recurrence and prevalence of this last noted condition may be of increasing importance in the future.

It is of considerable significance, therefore, that by locking the system into a decision making framework which only provides a ready-made solution at an extreme condition, the Supreme Court provisions do not utilize or reflect possible benefits of mathematical optimization procedures in the interior of the range of possible options, and impose a convenient but non-optimal solution to the system.

If each of the parties to the decree could be convinced that the interior decision space offers significant advantages to them, they might be convinced to unanimously alter the compact and approach the Supreme Court. It may be possible, after thorough study, to convince the states that their vested interests may be better served if some interior points are explored.

Accompanying this effort, however, would have to be the provision that no party to the original compact will be put into a position which is worse than the one it currently occupies.



## XVIII.A. INTRODUCTION

The analysis and comparison of the Delaware Water Gap National Recreation Area (DWGNRA) with and without a lake stems logically from projections of recreation supply and demand undertaken in Part A, Chapter IV and the evaluation of various regional recreational alternatives to satisfy this future demand undertaken in Part C, Chapter XIII. The chapter includes a summary analysis of each of the various plans for a DWGNRA with and without a lake; analyzes them in terms of the same set of land use, economic, social and environmental criteria used in Chapter XIII; and concludes with significant findings.

It should be noted that public land acquisition within the National Recreation Area has been occurring since 1966. Some parts of the National Recreation Area are already open to the public with current National Park Service facilities planned to be compatible with the ultimate development, whether based on a lake or a free flowing river. From this standpoint and the analysis in Chapters XIX and XX, recreational opportunities will exist at DWGNRA with or without TILP, and hence the evaluation of TILP should consider only its increment of recreation at DWGNRA and directly related impacts.

## XVIII.B. APPROACH

First, various conceptual forms of a recreation area with and without the Tocks Island Dam and Lake are possible and are under study by public agencies and private groups, including the Corps of Engineers (COE), the National Park

Service (NPS), the Save The Delaware Coalition (SDC), the Appalachian Mountain Club (AMC), and others. These alternatives will be briefly summarized and categorized according to various functional components. Secondly, the master development plan for the National Recreation Area with the Tocks Island Dam and Lake (TILP) has a long history of preparation, documentation, critique and reformulation. Essentially, the benchmarks of its progression are:

- the NPS Master Plan of 1966
- the NPS Master Plan of 1971
- a Critique of the 1971 Plan by Bellante, Clauss, Miller & Nolan
- the Conceptual Development Plan (in draft form) by Clarke and Rapuano, 1975 (a merging of the Corps' recreation planning efforts described in House Document 522 with the planning efforts of NPS noted above).

For the purposes of this evaluation, the most recent Clarke and Rapuano study is considered of primary importance. The alternatives of no National Recreation Area, with or without recreational development by the Corps on reservoir-related land and either State Park operation or private development of the rest of the lands are not discussed in this chapter, but more appropriately in Chapter XIX.

The procedure for arriving at a feasible alternative DWGNRA without TILP is more complex as various natural systems analyses are presently being undertaken by NPS consultants and AMC. Completion of these studies should be a direct input into this evaluation process and a significant update of it. The various alternatives under consideration will be categorized according to the following functional components:

- design load (in terms of a peak summer Sunday and annual visitation)
- facility mix
- spatial organization (with most alternatives falling into a dispersed, concentrated or linear configuration)
- transportation system (both in terms of modes considered and their operational network)

Chapter IV summarizes current trends in public recreational development from a supply and demand viewpoint. The range of views that exist on appropriate standards and criteria for recreation land planning are presented in Chapter IV and summarized here in XVIII.D.4 as they apply to the comparative analysis undertaken. These trends and standards become the basis for making assumptions for the above four functional components of a DWGNRA with and without TILP.

#### XVIII.C. DWGNRA WITH TILP

The Clarke and Rapuano Plan for the DWGNRA with TILP is based upon concentrated use in picnic and beach areas. Recreation will be reservoir oriented with access to inland areas. Aside from boat launching facilities and lakeside camping, overnight camps, group camps and hiking and horse trails will be offered for the land-oriented recreationalist.

The DWGNRA is presented as ten "parks within a park", each of which has a center for recreational use. The development scheme attempts to preserve the natural qualities of the area while developing the recreational facilities to the extent compatible with preserving the natural values of the region. Development plans for each of the ten "parks within a park" are briefly described and illustrated below.

The Delaware Watergap section - the southernmost part of the park - will be kept generally wild, with facilities for fishing, canoeing, picnicking and family camping.

Bushkill Creek region on the Pennsylvania side will support swimming and boating sites on the reservoir, swimming at Hidden Lake, and a variety of upland day and overnight use.

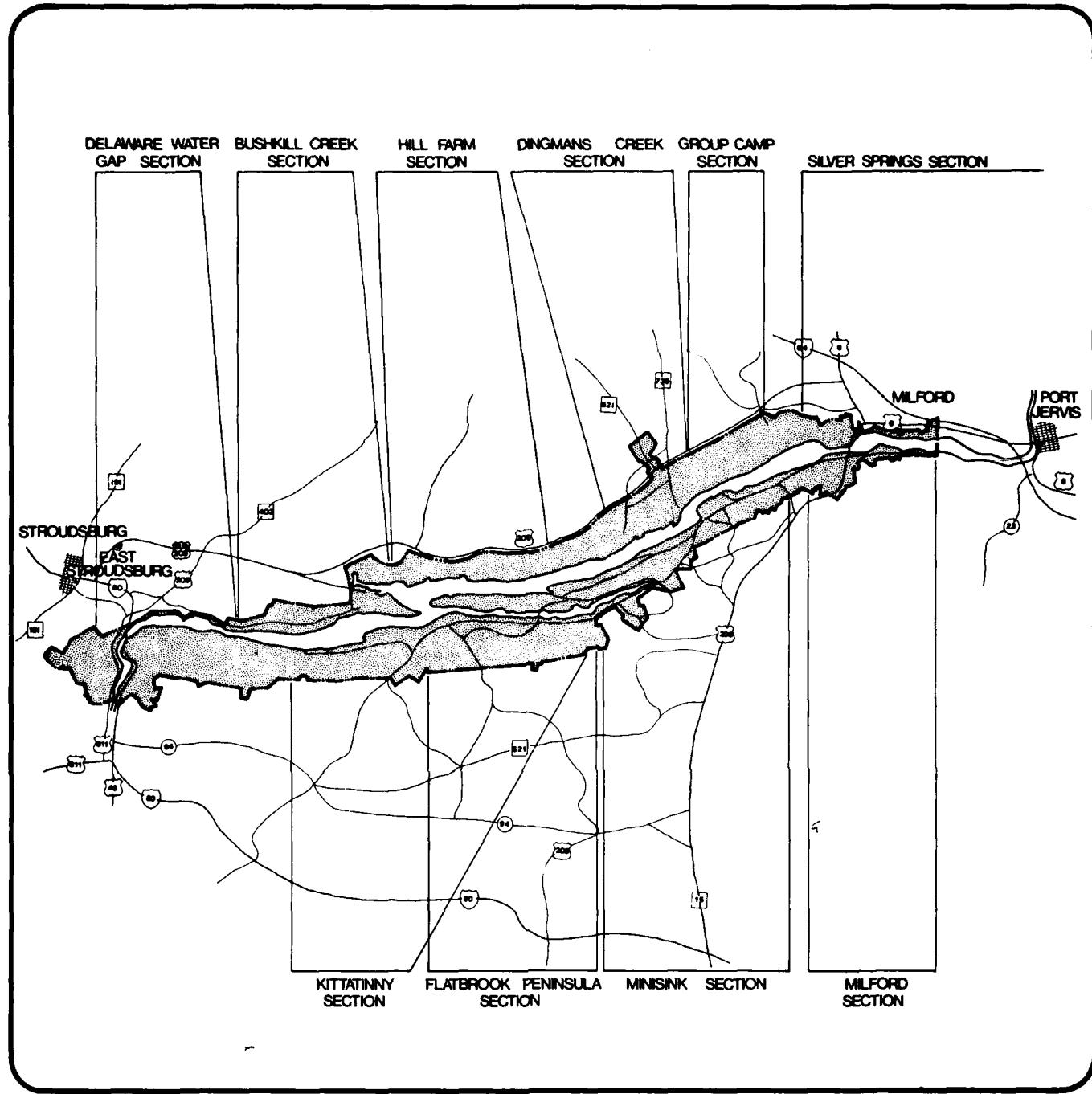
Kittatinny Ridge area on the New Jersey side is suitable for large-scale development with slopes good for campsites. There will be recreational development for many uses including a beach site.

Flatbrook Peninsula on the New Jersey side is relatively isolated and very scenic. There will be sites for boating, picnicking and camping.

The Hillfarm section on the New Jersey side has steep shores, except where the tributaries enter. The flatter spaces at the entrances of the tributaries can be used for small waterfront facilities with upland tent camping and picnicking near the inland lakes.

Dingmans Creek section on the Pennsylvania side will be developed for day use along the shoreline, including swimming, boating and biking, and the wooded plateau will be good for camping facilities.

The Group-Camp area will have swimming, boating and camping at each of the tributary entrances and along the reservoir shoreline. Large campgrounds will



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SCALE IN MILES



LEGEND

DWGNRA WITH TILP  
DEVELOPMENT SUB·AREAS  
SOURCE: CLARK AND RAPUNZO, INC.

XVII  
**1**

A COMPREHENSIVE STUDY OF THE  
**TOCKS ISLAND LAKE PROJECT & ALTERNATIVES**  
URS / MADIGAN - PRAEGER, INC. & CONKLIN AND ROSSANT

be developed in the upland fields and meadows of the old farms and estates. Many of these can be reached only by trail and boat due to the absence of parking space.

The Minisink area on the New Jersey side is suitable for a wide variety of day and overnight uses, including water and non-water sports and programs. The land is level near the reservoir, sloping up to the steep ridge. There will be room for shoreline development for beach and boating, and extensive picnicking. Campgrounds will be developed on the eastern slope.

Silver Springs region on the Pennsylvania side is accessible only by trail and boat and especially good for nature study.

The Milford section, again on the Pennsylvania side, would include extensive beach and boating facilities. There is also camping and picnicking in the rolling fields and woodlands overlooking the reservoir. This area will be particularly important for waterfowl management.

In conjunction with the "parks within a park" concept, the NPS is developing each recreational center with enough variety of activities in order that the people can find what they want at one center. Thus, movement from center to center within the park will be minimized, reducing intra-park traffic. The NPS Plans separate access roads to the different areas as they believe that reliance on central trunk roads along both sides of the river from Bushkill to Milford, Pennsylvania; and from Tocks Island to Van Campen Creek, New Jersey, would produce much congestion and more importantly, their environmental and economic costs would be prohibitive. Some public transportation will be developed

within the park. Shuttle boat routes across the reservoir are planned and will be particularly useful in beach area access. One major highway, Pennsylvania Route 209, will have to be relocated if the reservoir fills and if DWGNRA goes ahead without TILP. Various smaller roads and access routes will also be inundated by TILP, requiring considerable replacement of internal circulation routes.

The park will have facilities for both overnight and day users. Less than two-thirds of the visitors are expected to come for the day, commuting from the neighboring urban areas for a day's recreation (see Tables 22-18 and 22-19). The remaining visitors will plan a longer stay. The park will be open in winter and winter sport areas are planned. Activities in the park at various times of the year will include hiking, cycling, horseback riding and snowmobiling. Swimming, boating and fishing, both ice and open water, will be provided as well as picnic and camping facilities. Several interpretive and educational facilities, including interpretive trails, the Artists for the Environment Center in Poxono, ecological study centers, a Crafts Village in Peters Valley, and Arisbee (the Pierce Homestead) will be year round destinations for sightseers.

The NPS is interested in retaining the rolling farmland inter-mixed with woodland that defines the character of the Minisink region. This may be done either by leasing the land back to farmers for agricultural use, or by maintenance by the Park Service.

The headquarters and maintenance facilities would be located in the Bushkill section near Hidden Lake and the National Park Service is presently proceeding with its development. The site was selected to be suitable either for the

reservoir or the river-based park.

The Milford, Minisink and Flatbrook Peninsula areas have had fairly detailed plans developed. The Milford and Minisink area will be developed with high-intensity uses, their soils being suitable for this purpose. Flatbrook Peninsula (rugged in terrain and surrounded on three sides by the reservoir) will be kept more isolated with low-intensity use. Flatbrook Peninsula will have a ten mile one-way interpretive motor tour moving throughout most of the Peninsula. At the juncture of this tour road and Old Mine Road, horses and bikes will be available for hire.

There are five water-based recreational areas in these three park sections, all of them are located in the Minisink and Milford regions. These five areas are located on Figure 22-1. Visitors will move from a parking area through a buffer zone to the beach. There are seven shuttle boat landings in these three sections with picnic areas and campgrounds. Many of these landings also have boat, beaching and swimming areas nearby.

In the Minisink areas, there will be 2,270 picnic sites, 2,100 to 3,800 feet of beaches, 450 camping sites and 8,080 parking spaces. There are also 1,600 feet of boat beach, 1.5 miles of hiking or horsetrail. Boat docks are provided for 100 boats. The Milford area will include 1,250 picnic sites, 3,250 feet of beaches, 80 campsites and 5,000 parking spaces. There are 1,800 feet of boat beach. Flatbrook area will have 360 picnic sites, 455 camping spaces, and 250 parking spaces. There will be 5,650 feet of boat beaches and 20 miles of horse and hiking trails.

The Clarke and Rapuano Plan for a recreation area with a reservoir, concentrates use at certain areas leaving other areas wild. The park would depend on private automobile for internal transportation and would try to avoid massive congestion by separate access routes to each of these recreational areas and also try to minimize movement from area to area within the park. This concept depends on north-south longitudinal movement outside of the DWGNRA on limited capacity roads in order for the visitor to reach his selected entry point into the park. How successful this segregation of recreational areas will be is hard to judge.

#### XVIII.C.1 ANALYSIS OF DWGNRA WITH TILP

The Clarke and Rapuano Plan, prepared for the Corps and NPS is the basis for the following analysis. It envisions a gradual development of DWGNRA in three phases, beginning with an annual visitation of 4,000,000 and a design load of 40,585 for a peak day (summer Sunday) and reaching an annual visitation of 10,600,000 and maximum design load of 109,987 by the final Phase III development stage. Areas for possible future development are suggested on the site plan without designating their intended use.

The table below summarizes the carrying capacity of the park for its four basic activities (swimming, boating, camping and picnicking) based on the facilities to be provided. Over half of the total facilities planned at or near the lake are to be completed during Phase I, while development of upland areas will be completed in Phases II and III.

Table 18-1 DWGNRA With TILP/Clarke and Rapuano Plan - Phase I

Annual Visitation = 4,000,000  
 Design Load = 40,585

<u>Activity</u>	<u>Standard</u>	<u>Capacity of Facilities</u>	<u>Capacity (Persons)</u>	<u>Percent of<sup>1</sup> Design Load</u>	<u>Annual<sup>2</sup> Visitations</u>
<u>Swimming</u>	50 s.f. of beach/person		24,600	60.60	2,424,000
<u>Boating</u>	4 people/boat		4,820*	11.90	476,000
1. Ramp	40 boats/ramp per day	960 boats			
2. Beaches for boats		975 boats			
3. Rental facilities		100 boats			
4. Docks		700 boats			
5. Parking at ramps		700 boats			
Total number of boats on lake is assumed to be the sum of 3. and 5. above and 3. below: 1205					
<u>Camping</u>	4 campers per site				
1. Group		200 sites	800		
2. Hike-in		100 sites	400		
3. Boat-in		405 sites	1,620		
Total		705 sites	2,820	6.95	278,000
Total of 1. and 2. which are upland locations (300 sites) (1,200)					
<u>Picnic</u>	5 persons per table	2,565 tables	12,825	31.60	1,264,000
<u>TOTAL</u>			45,065	111.05	4,442,000

Notes:

1. Percent of design load equals capacity (persons) divided by 40,585 design load.
2. Annual visitation equals percent of design load times 4,000,000 annual visitation

The maximum number of boats on the lake at one time based on the facilities to be provided is considered to be the sum of: day users (measured by the number of parking spaces at ramps); rental facilities; and overnight facilities (measured by the number of boat-in campsites). The total represents one boat per ten water acres. This is perhaps higher than expected but may represent the maximum.

Table 18-2 DWGNRA With TILP/Clarke and Rapuano Plan - Phase III

Annual Visitation = 10,600,000  
 Design Load = 109,987

<u>Activity</u>	<u>Standard</u>	<u>Capacity of Facilities</u>	<u>Capacity (Persons)</u>	<u>Percent of Design Load</u>	<u>Annual Visitations</u>
<u>Swimming</u>	50 s.f. of beach/person		49,600	45.1	4,780,600
<u>Boating</u>	4 people/boat		10,340	9.4	996,400
1. Ramp	40 boats/ramp per day	2,360 boats			
2. Beaches for boats		2,040 boats			
3. Rental facilities		200 boats			
4. Docks		700 boats			
5. Parking at ramps		<u>1,580 boats</u>			
Total number of boats on lake is assumed to be the sum of 3. and 5. above and 3. below: 2,585					
<u>Camping</u>	4 campers/site				
1. Group		1,450 sites	5,800		
2. Hike-in		3,390 sites	13,560		
3. Boat-in		<u>805 sites</u>	<u>3,220</u>		
Total		5,645 sites	22,880	20.8	2,650,000
Total of 1. and 2. which are upland locations (4,840 sites)(19,360)					
<u>Picnic</u>	5 persons per table	11,075 tables	55,375	50.4	5,342,400
<u>TOTAL</u>			138,195	125.4	13,769,400

Notes:

1. Percent of design load equals capacity (persons) divided by 109,987 design load.
2. Annual visitation equals percent of design load times 10,600,000 annual visitation.

The total level of boating represents about one boat per five water acres.

From the table above, it is obvious that the Clarke and Rapuano Plan has anticipated a fairly sizeable portion of the visitors using more than one facility, but there is no documentation as to the extent of this occurring. On the other hand, there is no indication of the contribution of other activities (hiking, outdoor sports, etc.) to the design load.

An approximation of visitors whose primary interest is an activity other than the four primary ones can be made as follows: assume a percentage of each number of participants within a primary activity who also participate in another activity; subtract this from the total capacity of the four primary activities; subtract this adjusted capacity from the design load and arrive at the number of participants in activities other than the four primary activities.

Table 18-3 DWGNRA With TILP/Primary to Secondary Activity Assumptions

<u>Boating:</u> (capacity in persons)	<u>Phase I</u> (4,820)	<u>Phase III</u> (10,340)
1. Some of these are already assumed to occupy a boat-in campsite...	1,620	3,220
2. Of the remaining, at least half will use a beach for swimming...	1,600	3,560
3. and half will use a lakefront picnic table...	1,600	3,560

	<u>Phase I</u>	<u>Phase III</u>
<u>Camping:</u> (capacity in persons)	(2,820)	(22,880)
1. Perhaps 90% of the other campers <sup>1</sup> will go swimming... 1,080		17,784
2. Assume none will use a picnic table since each campsite should have one...	0	0

	<u>Phase I</u>	<u>Phase III</u>
<u>Picnicking:</u> (capacity in persons)	(12,825)	(55,375)
1. During the first phase, less than half will use a beach during a day's outing and less than 25% during the third (many public sites will not be near a beach)	5,600	12,950

Swimming: (beaches)

The overlap here is already mentioned above...	0	0
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<u>TOTAL</u>	11,500	41,074
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<u>Total Capacity of swimming, boating, camping and picnicking from previous Phase I table:</u>	45,065	138,195
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<u>Less Overlap:</u>	<u>-11,500</u>	<u>-41,074</u>
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<u>Adjusted Capacity:</u>	33,565	97,121
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<u>Design Load:</u>	40,585	109,987
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<u>Less Adjusted Capacity:</u>	<u>-33,565</u>	<u>-97,121</u>
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<u>Visitors whose major interest lies in other activities:</u> 7,020		12,866
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Notes:

1. Non boat-in campers.

These visitors represent approximately 17.3% of the design load in the first phase, and 11.7% in the third. For comparison purposes, a distribution of these visitors on the basis of their activity might be as follows:

Table 18-4 DWGNRA With TILP/Facility Mix Assumptions

<u>Activity</u>	<u>Phase I</u>		<u>Phase III</u>	
	<u>Number</u>	<u>% of Design Load</u>	<u>Number</u>	<u>% of Design Load</u>
Camping	2,820	7.0	22,880	20.8
Boating (day use)	3,200	7.9	7,120	6.5
Picnic (less boaters)	11,225	27.7	51,815	47.0
Swimming (less boaters, campers and picnickers)	16,320	40.2	15,306	14.0
Total	33,565	82.8	87,121	88.3
Other Activities		17.2		11.7

Two basic inferences can be drawn from the above tables. First, a heavy emphasis has been put on swimming and picnicking, and this is perhaps justified given the regional demand estimates. The second is that water-based activity will be the predominant demand. From the Table 18-1 analysis based on design standards, during Phase I, over 70 percent of the design load can be accommodated at any one time with the boating and swimming facilities (and this assumes a turnover of 1 and neglects fishermen). During Phase III, when the upland development has been completed, over 50 percent can be accommodated at any one time in water-based activities.

It is felt that a more detailed analysis of the design load, with some account made of the other activities, is in order before planning the capacities of beaches and picnic facilities. It may well prove that preference for other activities will account for a sizeable portion of the visitors, perhaps 25 to 50 percent. (See Candeub and Fleissig, "A Concept Plan For The Delaware River"),

and that the facilities built during Phase I will be adequate for all time. Once a beach or picnic area is cleared and graded, it would take years and unnecessary cost to return it to a natural state. A further analysis of secondary activities generated by a visitor is found on Table 13-5.

#### Spatial Organization

Two basic patterns are utilized. Lakefront development, which is more intense than the uplands development, tends to be concentrated in a few areas. Picnic sites are clustered near boat beaching facilities and swimming beaches. These, along with boat-in campsites are connected in a linear pattern via roadways to the entrance station.

Upland development, consisting mainly of hike-in and group camps, are more dispersed throughout the site. Many have access to the lake via trails and some by road.

#### Transportation

The Clarke and Rapuano Plan has assumed the automobile to be the universal mode of transportation to, from, and within DWGNRA. While the text mentions the possible use of bus service to the area and the existence of rail service to Port Jervis and Stroudsburg, all of the waterfront camp, picnic and beach sites have parking adequate for the visitor capacity at every area. By definition, the hike-in campsites are inaccessible by car, but adequate parking for these visitors exists elsewhere within the park.

Access to the park is provided at several points, each with an entrance station. North-south access within the park is severely limited. Many of the existing roads will be inundated after impoundment and, as mentioned in the Save The Delaware Plan, a new north-south road system would involve a great deal of regrading and environmental damage in some areas, with the corresponding problem of erosion (i.e. on the side of Kittatinny Mountain.)

#### XVIII.D. ALTERNATIVE DWGNRA WITHOUT TILP

The various alternatives for recreation areas without TILP are summarized below along with preliminary evaluative comments. It should be noted that an additional 12,000 land acres are available for recreation with the absence of the lake. The first set of alternatives are those under consideration by the NPS and presently have transportation systems, both nodes and network as their primary organizing element, at least at their present level of consideration. This appears to be a major fundamental difference to DWGNRA with TILP - the way in which activity and service areas are concentrated and given access to. With the Tocks Lake, the potential for north-south vehicular connections between the New Jersey and Pennsylvania sides within the DWGNRA are virtually eliminated. As it is the policy of NPS to promote and encourage mass transit within and to all its parks and recreation areas from population centers and eventually eliminate private vehicular penetration to the greatest extent possible within their boundaries, various public transit alternatives are considered. These include both bus and rail alternatives. The following alternatives are illustrative of the range being considered and are not a comprehensive listing of all possible transportation configurations.

#### XVIII.D.1 SAVE THE DELAWARE COALITION PLAN (SDC)

The first is the Save the Delaware Coalition alternative set forth in the document "An Alternative to the DWGNRA Preserving the Free Flowing Delaware River" by Candeub and Fleissig, dated April, 1974. This proposal assumes two primary activity/transportation nodes with major car/bus transfer at the Water Gap and Milford, and two secondary nodes near Bushkill and Dingmans Ferry. The recreation facilities of swimming, boating, picnicking, historic sites and buildings, interpretive centers, bicycling, fishing and ferry crossings, are in the lowlands region located in a somewhat dispersed but linear fashion reflecting the lineal structure and natural features of the park area. Camping and camping related picnicking are the primary facilities in the uplands region along with secondary activities of hiking, horseback riding and hunting. The river-based plan puts less emphasis on water sports than the reservoir plan; it is oriented toward movement along the river rather than visiting one recreation area and staying there. The park without the reservoir would include twelve islands, ten miles of trout streams, two waterfalls of major size, fifty ponds, twenty-one miles of the ridge and the Water Gap. The park with the reservoir would inundate all of the islands, a few miles of trout stream, and several ponds. The proposed mix of these facilities is estimated from Figure 1, page 48 of the SDC Plan document. (See Table 13-6 for a detailed analysis of visitation.)

Table 18-5 DWGNRA Without TILP Facility Mix Assumptions

Save The Delaware Coalition (for a peak summer Sunday use)

Activity

Camping	15.2%
Picnicking	17.3%
Swimming	15.6%
Canoeing, Boating, Rafting	9.5%
Sightseeing, Interpretive and Environmental Education Centers	15.2%
Bicycling, Hiking, Horseback Riding	15.2%
Fishing	6.2%
Other	5.8%
	<u>100.0%</u>

The design load for this proposal can only be estimated from the concept plan in its present preliminary form (see Table 18-8 and 13-6). From page 47 of the SDC Plan document:

"Exact determinations of carrying capacity must depend on careful Park analysis and design, but it appears that the four million visitor days per year contemplated by the reservoir plan could be accommodated under this "natural systems" concept plan because of the large diversity of facilities, which can be used throughout much of the year. And if activities are confined to a scale and type appropriate to the Delaware Valley, this figure can only be approached without a dam. It can be approached with the present plan but extreme care must be taken not to overburden the natural, historic and cultural resources in order to protect the quality of experiences to be gained".

Initial evaluation of this concept by the consultant and NPS raises the following issues. It appears difficult to locate a transportation node at or near the Water Gap on the New Jersey side. Entering and exiting automobiles and bus traffic to and from this node have to mix with interstate traffic to get to the Pennsylvania side of the park. With the stringent topographic and environmental constraints of the Gap itself, road geometrics would be tight and the existing

entry road into the park on the New Jersey side off of Interstate 80 has road width problems which would be difficult to relieve. The problem of locating surface and/or structured parking in an aesthetically pleasing solution appears extremely difficult and would, of course, be a likely additional capital cost.

Perhaps more to the point is the possible preference of more than two nodes located within the park rather than at the extremities, so that transit services could be provided in two directions from each node, greatly reducing travel distances and visitor travel time.

"The visitor's time frame, especially a day visitor, must be considered. Most day visitors have a four to five hour stay and their use of a transit service must be limited to twenty to twenty-five percent of the stay. Visitors will strongly prefer not to use a long-distance transit service that requires more than an hour, one-way"

(NPS comments)

Under the "two end node" concept some NRA facilities are likely to be quite distant from the end nodes. This would require lengthy bus routing and would reduce the time available for park visits. Under this configuration, a large number of buses are required necessitating a high capital cost to provide an adequate level of service.

General requirements regarding the exclusive use of bus transit within the NRA include the probable need for special vehicles for handling large recreation equipment such as canoes, bicycles, etc. The cost per visitor of public transit is difficult to estimate at this point. However, a multi-node approach will be more cost effective than the "two-end node" concept, and this is the approach being taken by NPS.

#### XVIII.D.2 OTHER TRANSPORTATION ORIENTED DWGNRA PLANS

Given the above transportation oriented concerns, this set of alternatives includes various numbers and locations of transportation/activity nodes, in an attempt to achieve a smaller service area (a radius of six to ten miles) for each node. There is also the possibility of two levels of bus service:

- one connecting the various nodes
- the second providing access to facilities from each node.

These alternatives being evaluated include:

- a five node scheme (New Jersey side of a proposed bridge at Bushkill - south of Walpack Bend; south of Bushkill on the Pennsylvania side; on the New Jersey side opposite Dingmans Ferry; Dingmans Ferry on the Pennsylvania side; Montague opposite Milford)
- a four node scheme (Water Gap; west of Walpack Bend on the Pennsylvania side; Dingmans Ferry on the Pennsylvania side; Milford)
- a three node scheme (all on the Pennsylvania side: Bushkill, Dingmans Ferry, Milford)

It should be noted that in order for DWGNRA to be viable from a visitation standpoint, U.S. 209 in Pennsylvania must be relocated, as both management and operations of the Pennsylvania side of the NRA would be extremely difficult without relocation and upgrading due to both existing and future traffic congestion and virtually unlimited vehicle access to the NRA. As an NRA only on the New Jersey side of the Delaware River appears unfeasible from both a visitation and political viewpoint, it is assumed for all alternative DWGNRA's without TILP that U.S. 209 will be relocated.

Various mixes of vehicular transportation modes generate potential alternatives. "The potential for rail transit is available via the Erie-Lackawanna Railroad

which enters the NRA in the south at the Town of Delaware Water Gap and in the north at Port Jervis" (NPS comments). This regional rail service could conceivably supplement an upgrading of existing regional bus service to centers of the area: the Stroudsburgs, Blairstown, Newton, Milford, Port Jervis. However, this would entail reinstating the Erie Lackawanna service terminated to Stroudsburg in 1960. Railroad management appears opposed to this concept nationwide even when approached by upper administration officials of the Department of the Interior. A successful application of this railroad concept, under severe environmental constraints, is Mt. McKinley National Park, Alaska, which has an internal bus network transferring to private car and railroad connections to Anchorage. The Federal Government does control this railroad, hence cooperation is easier to obtain.

Recognizing that each modal transfer adds markedly to the total visitor travel time, the following alternatives are being considered:

- a car-only version assuming a road network and access pattern similar to that described in the Clarke and Rapuano NPS/COE Conceptual Master Plan of 1975.
- a public transit and private car alternative as yet to be fully described.
- a mass transportation/rail alternative based on the premise that in comparison to bus transit, the level of service would be faster and of greater capacity. Capital costs in comparison to improving existing roads would initially be greater, but perhaps would be offset by lower future maintenance costs. Public acceptance of rail transit may be greater, as there is a natural aversion by some to bus travel, particularly by those who rely on it for commuting to work.

The spatial configurations of the above transportation oriented alternatives derive directly from the number and location of nodes as transfer points, the regional access and internal modes of transportation, and the level of service connecting the various nodes. The nodes themselves would serve as centers for intensive lowland recreation activity including boating, swimming, picnicking and camping along with interpretive and orientation centers, equipment rental, and access points to hiking, bicycling and horseback riding. Less intense upland and lowland activities would have access from the connecting service between nodes. The basic linear, dispersed and concentrated configurations are analyzed in the second part of this chapter.

#### XVIII.D.3 NATIONAL PARK SERVICE PLAN (NPS)

The National Park Service Plan represents the least intensive DWGNRA development scheme, with an instant capacity of 18,335 and a total annual visitation of 1,185,000. Of the range of activities indicated on Table 18-6, which follows, picnicking, trail use (hiking, biking, horseback riding), swimming, and boating are key park activities with fishing and active sightseeing secondary in importance. This Plan recognizes the importance of overnight visitations and indicates the possibility of providing family camping only at the major activity nodes. DWGNRA activities are organized around five nodes, each with an instant capacity of approximately 4,000 visitors. Each serves as a focal point within DWGNRA and would contain picnicking, an interpretive center, equipment rental concessions (horses, bikes, boats), restaurants, and other essential facilities. A key function of these nodes would be for parking and transfer points to an internal bus system on the New Jersey side. Most park visitors would enter and leave by automobile via these nodes located in lowland areas at equidistant intervals within DWGNRA, dividing the park approximately in quarters. These

Table 18-6 Capacity and Visitation of DWGNRA Without TIP - National Park Service Plan

	<u>Hiking/ Biking/ Horse Riding</u>	<u>Boating</u>	<u>Swimming</u>	<u>Picnicking</u>	<u>Fishing</u>	<u>Family Camping</u>	<u>Overnight Accommo- dations</u>	<u>Active Sight- seeing</u>	<u>Total</u>
Instant Capacity	1,700	2,000	2,880	5,000	700	3,600	1,365	480 & 630	18,355
Daily Turnover	2.0 <sup>1</sup>	1.0	5.0	1.5	1.0	1.0	1.0	8.0 & 5.0	
Daily Activity Days/ Visitation (within 24-hour period)	3,800	2,000	14,400	7,500	700	3,600	1,365	6,990	
% Yearly Capacity on Peak Day	2.3	1.6	1.6	2.2	1.0	1.6	2.2	1.6	
Yearly Activity Days/Visitation	165,217	125,000	900,000	340,909	70,000	225,000	62,045	436,875	
Number of Activity <sup>2</sup> Days/Visitor	2.5	2.25	1.5	2.35	2.35	2.80	2.80	2.35	
Yearly Visitors	66,087	55,556	600,000	145,068	29,787	80,357	22,159	185,904	1,185,000
Plus Drive Through Sightseers									<u>467,000</u>
TOTAL ANNUAL VISITATION									<u>1,652,000</u>

Source: Memo from NPS/Philadelphia, May 5, 1975; subsequent discussions with Appalachian Mountain Club, Gorham, N.H.

Notes:

1. Standard is NPS, otherwise consultant daily turnover factors are used.
2. See Table 13-5 for assumptions regarding activity days generated by individual DWGNRA visitors.
3. Includes 975 group campers, 90 vacation farmers, and 300 hostel users.
4. Includes 20 nature and interpretive trails, each with one group of 20 visitors, turnover of 8; Dingman's Falls View, with 100 persons, turnover of 8; four historical farms with 30 persons/hour; and three villages (Millbrook, Walpack and Peters Valley) with 1,000 visitors/day, turnover of 5.

would be located as follows:

Milford	- New Jersey side
Bushkill	- New Jersey and Pennsylvania sides
Dingmans Ferry	- New Jersey and Pennsylvania sides

NPS would maintain and expand its Water Gap information and orientation center, but it would not function as a major park activity node.

Movement within DWGNRA would be structured to occur primarily between nodes.

On the Pennsylvania side, private cars would be used exclusively with access into DWGNRA from relocated U.S. 209 at several major interchanges and intra-park movement along the river on the Shawnee River Road and the old U.S. 209. On the New Jersey side, mini-buses, operating between Bushkill, Dingman and the Milford Bridge, would provide the only motorized transport. Cross river connections would be provided by the existing Milford and Dingman's Bridges and a possible ferry crossing connecting the two Bushkill activity nodes. Hiking, and bicycling would provide the only means of access between Delaware Water Gap and the areas opposite Bushkill on the New Jersey side. These means would also supplement the mini-buses between the Bushkill and Milford nodes.

The NPS facilities for the typical summer Sunday mix is described below. Four river swimming beaches with a total instant capacity of 1,700 would be located at Tocks Island and Milford on the Pennsylvania side, and at Bushkill and Dingmans Ferry on the New Jersey side of the river. Boating, with an instant capacity of 2,000, would primarily consist of canoeing and rowboating, and would center around the Bushkill and Dingmans Ferry activity centers. A substantial amount of boating would be for access to boat-in overnight campsites.

Envisioned trail uses consist of biking, hiking and horseback riding. Approximately 100 miles of bike trails would be built along both the Pennsylvania and New Jersey river sides. Eighty miles of back country trail would be built, including one half way up the New Jersey ridgeline, from Delaware Water Gap to Milford. Another 40 miles of riverside trail would be constructed for hikers. Separate horse trails would be constructed in the vicinity of Millbrook on the New Jersey side, and on upland areas of the Pennsylvania side.

Two hundred picnic tables would be provided at each of the five activity nodes for a total of 1,000 tables, and an instant capacity of 5,000.

Environmental education, in the form of active sightseeing would also occur within DWGNRA. Facilities include twenty native trails, four living historical farms, six working vacation farms, and three villages focusing on the existing Millbrook Village, Walpack Center, and Peters Valley.

Overnight facilities would be provided for nearly 5,000 visitors. Of the total, 3,600 would be family camping and 1,365 would stay in motel and lodge-type accommodations at the Bushkill and Dingmans Ferry nodes, most likely in converted existing structures.

The present level of definition of these alternatives in terms of facilities provided and their mix does not allow for a specific determination of their design load and annual visitation. Assumptions made as to appropriate ranges illustrative of these alternatives are described also in the second part of this chapter,

#### XVIII.D.4 APPALACHIAN MOUNTAIN CLUB PLAN

Illustrative of the low end of the design load range is the alternative for DWGNRA without TILP being prepared by the Appalachian Mountain Club, which provides for the recreation activities of hiking, canoeing, camping, cross-country skiing and bicycling. It will be based on design capacities for river use, campsite areas and trails as they relate to soil, vegetation and terrain suitability based on intensive site surveys. Design, management and maintenance techniques will be recommended based on recreation demand by facility types and types of users. An overall design load will be calculated for the Plan and its program of facilities. The study should be completed shortly and is expected to complement the NPS Plan previously described.

#### XVIII.D.5 ALTERNATIVE DESIGNATIONS TO A NATIONAL RECREATION AREA

Preliminary consideration and evaluation by the consultant is also given to potential alternatives to the concept of an NRA itself for purposes of both preserving and properly utilizing the natural and cultural resources of the immediate DWGNRA area without TILP. These alternatives are also being considered by private and public groups including local and county governments. They include the following:

- The upper basin portion of the Delaware River from a few miles upstream of Port Jervis to Hancock, New York, is likely to be designated a National Scenic and Recreational River under the Wild and Scenic Rivers Act (PL 90-542). A draft environmental impact statement has been reviewed and the Bureau of Outdoor Recreation is presently preparing the final study report and the final environmental impact statement on the proposal. An alternative course of action to

the NRA would be the extension of this Scenic and Recreational River downstream through the Water Gap. Based only on a preliminary assessment, this segment of the river appears to comply with the Act's criteria for designation as a Scenic and Recreational River with the major urban centers of Milford and Dingman's Ferry primarily out of view from the surface of the water. Under this program, protection boundaries are proposed from ridge to ridge on either side of the river. Within this river environment, a land management process would consist of a temporary moratorium on development, adoption of zoning and local implementation of a land use guidance system. This process would be the responsibility of the two states, DRBC and the local governments. NPS would assume recreation management responsibilities. Under the Act's requirements many of the recreation activities listed on XVIII-32 are allowed depending on the special attributes of the area, resulting in a likely peak summer Sunday design load somewhat less than that projected for DWGNRA without TILP. This alternative is further discussed in Chapter XIX.C.1.

The question has been raised by many whether the Recreation and Scenic Rivers designation alone would be adequate to hold all the presently acquired COE and NPS land along with the planned future acquisitions. If not, the Recreation and Scenic River core designation could be supplemented by an exterior ring of NRA land as both would be administered by NPS. This could allow for a more intensive recreation development and a higher design load. However, if the DWGNRA does continue upon deauthorization of TILP (see Chapter XIX), this designation may only be useful for limiting certain types of recreation, otherwise it would be redundant. It should be noted that with either continued NRA designation or extension of the upstream Scenic and Recreational River designation for the Port Jervis to Water Gap segment of the river, a potentially complementary relationship with the proposed upstream National Scenic and Recreational River would exist as both segments would have similar development

and preservation objectives. Inclusion of TILP within the DWGNRA would increase the water related recreational pressures on the upstream segment.

- Another potential alternative is the designation of all the properties as a National Historic Area (NHA). It is the initial conclusion of the Consultants that although the Minisink Region contains many structures and sites that are both old and interesting, they are not of the historical significance required to warrant a single NHA designation. However, it should be noted that NHA designation is often carried out at the whim of Congress without reference to the NPS guidelines for an NHA. Without this designation, there is no reason why the historical culture of the Minisink cannot be properly preserved, restored where appropriate, adequately researched, and properly interpreted for the public visitor within all of the above considered alternative DWGNRA's without TILP. A full assessment of historical structures and resources within the DWGNRA is found in XXII.C.5(b); and archeological sites and resources in XXII.C.5(a).

- Based on NPS guidelines for National Parks (NP) versus National Recreation Areas (NRA), it is the Consultants' view that the Water Gap and Minisink area do not qualify under these guidelines for natural areas, essentially lands on which the "evidence of man induced changes are relatively absent". A preliminary analysis of the DWGNRA's land use prior to acquisition indicates a range breakdown of:

20 - 25% agricultural

70 - 80% natural state including some successional growth from original farmlands

2 - 3% developed state (includes towns and roads)

indicating a significant human impact on the lands. It should also be noted that National Park Service administrative policy for NP's prohibits hunting, which is allowed in an NRA, and require the natural preservation of lands which

would allow the existing fields and open space to return to their initial forested condition due to natural succession.

- Finally, the alternative of turning the acquired lands over to the two State Park systems at a discounted value under the Surplus Land Act is considered. The infeasibility of this approach appears to be tied to the inability of the State Park systems to acquire this amount of land due to the stringent limitations of their bond issues, and the lack of funds for park maintenance.

Within these considerations of various overall NPS designations, whether a National Recreation Area, National Park, National Historic Area, Scenic and Recreational River, or other, is the major concern of the type and range of overnight facilities to be provided within the park designation and its resultant impact on the surrounding communities. Most recent NPS administrative policy (2/4/75) for all of the above designations states the following:

"The location and use of many parks is such that visitors need overnight accommodations in or near the park in order to enjoy their visit. Certain park uses, such as backcountry use, may require overnight stays. Where visitor facilities can be satisfactorily provided outside of park boundaries, or where park resources cannot accommodate such use, they will not be provided within. Overnight accommodations may vary from unimproved backcountry campsites to substantial lodging, as appropriate. Whenever accommodations must be provided in the park by a concessioner, they will be provided in a price range that will serve the broadest spectrum of visitors.

Formal Campgrounds - New formal campgrounds for tents and recreation vehicles may be provided in parks only when it can be clearly demonstrated that they are essential for park use and that the private sector or other public agencies cannot or will not adequately provide for them in the park vicinity.

Campground design will be flexible....However, the Service will not attempt to provide a full range of technological amenities and utility hookups associated with some private campgrounds.

Campgrounds capable of attracting large recreation vehicles or buses should not be located where a park access road, otherwise capable of accommodating visitor traffic, is incapable of accommodating the camping recreation vehicles safely without upgrading of the road, or where the presence of such vehicles could cause traffic jams or threats to visitor safety.

Campgrounds should be limited to 250 sites, except where a large number of sites is approved by the Director. Modest-sized play areas containing swings and other playground equipment for small children are permissible, as are informal areas for field sports. Provision will be made for the use of charcoal or other fuels, or of central cook sheds....Where desirable for purposes of management, tent camping may be provided in separate campgrounds or in separately designated areas within campgrounds. Sanitary dump stations will be provided at Class A campgrounds accommodating recreation vehicles.

Group Campgrounds - Provision may be made for accommodating organized camping groups in separate campgrounds or in campsites adjacent to, but separated from, individual sites within formal campgrounds.

Boaters' Campgrounds - In parks with water areas subject to recreational boating, boaters' campgrounds may be provided. The nature of the body of water (river, lake, reservoir, salt water, etc.); the capacity of the environment to accept the use without adverse effects on the resource; the feasibility of providing and maintaining docking, beaching, mooring, camping, and sanitary facilities; and legal and policy considerations will determine the size, location, and number of planned campgrounds. Where facilities cannot be provided, or circumstances warrant, boating use may be regulated.

Backcountry Campsites - Backcountry and wilderness campsites may be provided to permit, but not exceed, acceptable limits of use determined for each park in the resource management plan.

Hostels and Low Cost Accommodations - Where appropriate to the planned use of given park, the Service supports the provision of hostels and other low cost accommodations for the use of visitors--particularly for younger people and those of limited means. Such facilities, utilizing existing or new park structures would ordinarily be provided when they facilitate park use. They may be provided and operated by others under agreements with the National Park Service when available for use by the general public. They may also be supplied by park concessioners or, if necessary, by the National Park Service".

Overnight camping constitutes one of four primary recreation activities offered by DWGNRA. Because of its popularity, some camping is required in DWGNRA to achieve the objective of providing a balanced facilities mix. Camping facilities should complement those provided outside DWGNRA by private entrepreneurs. Access and topography make DWGNRA highly suitable for camping. The strong visual image created by the river valley generates a unique and desirable aura conducive to overnight stays.

Certain siting and access criteria will maximize the quality of experience and minimize the number of suitable camping sites. Access, mode, view, location near water, location near hiking trails, and natural systems constitute key locational criteria. Small scattered camping areas would be most preferable. The completion of NPS' Basic Resource Inventory and Impact Analysis procedure will allow for the determination of appropriate sizes of various camping areas based on the above criteria, stressing the natural systems factors of vegetation and forest cover, soils, bedrock and geology, drainage, existing land use, etc. Standards presented as desirable guidelines for camping and other activities are presented and analyzed in XVIII.E.4.

Both group and formal campsite locations scattered among wooded uplands, and concentrated along shoreline areas, would provide the maximum variety. Appropriate campsite access policies would include severely limiting private cars and campers, and encouraging hike-in, bike-in, and boat-in campsites. Experience elsewhere would indicate that not much can be done to encourage hike-in use of formal campgrounds. Those who want and will use formal campgrounds will go elsewhere if they cannot get to their campsite in a vehicle.

Hostels for limited income people, the young and the elderly, and groups, constitute an appropriate reuse of historical structures. These should be near public transportation and/or hiking trails. User auto access might be prohibited.

A deluxe park lodge would fill the remaining gap in overnight visitations. This structure would excell in architectual design, quality and be located on a visually unique and outstanding DWGNRA site. The character of this structure and its setting would significantly contribute to DWGNRA's image for quality recreation experiences.

Initial qualitative impacts of alternative facility mixes including overnight accommodations are described in the second part of this chapter.

#### XVIII.E. POINTS OF COMPARISON AMONG ALTERNATIVE DWGNRA'S

The following comparison of alternative DWGNRA's with and without TILP are separate analyses organized by the following topics:

- Comparative visitation levels and facility mixes.
- Comparative parks versus alternative DWGNRA's being considered.
- Local impacts on the immediate region of the alternative DWGNRA utilizing the recreation alternatives (Chapter XIII) impact criteria.
- Comparative DWGNRA with and without TILP recreation standards.
- Comparative DWGNRA with and without TILP natural systems impacts.

#### XVIII.E.1 ALTERNATIVE DWGNRA VISITATION LEVELS AND FACILITY MIXES

Proposed recreation activities in all DWGNRA plans are based on their current popularity with park users. While as many as 23 types of recreation opportunities may exist within DWGNRA, the majority of the park's visitors, with or without the lake, will participate in a few key activities including swimming, boating, picnicking, camping and trail use. The full range of activities includes:

swimming	canoeing	soccer
picnicking	water skiing	skiing
sightseeing	fishing	ice skating
pleasure driving	hunting & shooting	basketball
off road driving	tennis	baseball
bicycling	horseback riding	football
boating	hiking and nature walks	hockey
birdwatching	snowmobiling	

Eliminating winter, court and field sports approximates the range of activities available in all DWGNRA plans.

Recreational activity preferences of the recreation service area population, expressed in terms of participation rates, indicate the relative popularity of activities. (Refer to Table 18-7, which follows).

Table 18-7 Outdoor Recreational Activity Preferences (User Days Per 1000 Population Per Year)

<u>Recreation Activity</u>	<u>Ide</u> <sup>1</sup>	<u>SCS</u> <sup>2</sup>	<u>MAPC</u> <sup>3</sup>
Swimming	21.8	8.5	46.8
Boating	3.0	1.8	7.3
Camping	3.0	.6	2.9
Picnicking	6.0	4.4	4.4
Fishing	4.7	2.4	4.8
Hunting	2.1	NA	NA
Bicycling	9.3	NA	
Horseback Riding	2.0	NA	17.6 <sup>4</sup>
Hiking, Nature Walk	<u>7.2</u>	<u>2.1</u>	<u>2.3</u>
Total	59.1	19.8	86.1
Swimming as % of Total	36.9%	42.9%	54.4%

Notes:

1. Source: Ide Associates, Bala Cynwyd, Pennsylvania, 1975. Based on a Pennsylvania statewide survey. Assumes 6% indoor swimming, and 70% residence based bicycle riding.
2. Source: U.S.D.A. Soil Conservation Service, Technical Note UD 2, 5/14/68. "Estimating the Demand for Outdoor Recreation Activities in Recreation Developments." These participation rates are adjusted for 11 northeast states. These rates are used when planning dam based recreation facilities similar to, but smaller than DWGNRA.
3. Source: Metropolitan Area Planning Council, "Recreation Demand", survey of Boston, Mass. metropolitan area summertime recreational activity preference, January, 1973. Assumes 10% indoor swimming.
4. Includes bicycling and horseback riding.

Table 18-7 above indicates that swimming, trail use (hiking and biking), picnicking, boating, and camping, are among the most popular outdoor activities, accounting for between 50 and 75 percent of all outdoor recreation activity days. Swimming is the key outdoor activity, accounting for 1/3 to 1/2 of all outdoor recreation. Swimming's importance is of particular significance in evaluating DWGNRA recreation alternatives.

Recreation Alternatives Analysis

Table 18-8, below, indicates the activities mix of the four current DWGNRA Plans. These include the non-TILP plans developed by the National Park Service (see XVIII.D.3) and the Save The Delaware Coalition Plan (see XVIII.D.1 and XIII.F.1). TILP alternatives include the Clarke and Rapuano Plan, Phase I and Phase III (see XXII.A.3).

Table 18-8 DWGNRA Recreation Plans Summary: Instant Capacities by Activity

	Non-TILP Plans		TILP Plans	
	NPS	SDC <sup>1</sup>	Phase I <sup>2</sup>	Phase III <sup>2</sup>
Swimming	1,700	6,240	24,600	49,600
Boating	2,000	3,800	4,820	10,340
Camping	3,600 <sup>3</sup>	6,080	2,820	22,880
Picnicking	5,000	6,920	12,825	55,375
Hiking/Biking	2,880	6,080	not indicated	not indicated
Other	3,175 <sup>4</sup>	10,880 <sup>5</sup>	not indicated	not indicated
Total Instant Capacity	18,355	40,000	45,065 <sup>6</sup>	138,195 <sup>6</sup>

Notes:

1. Source: Table 13-6 Capacity and Visitation of DWGNRA Without TILP.
2. Source: Table 18-1 and 18-2 Annual Visitation TILP Phase I, TILP Phase III.
3. Excludes 1,365 overnight visitors in other accommodations within DWGNRA.
4. Includes 1,110 active sightseers, 1,365 overnight visitors, and 700 fishermen.
5. Includes 6,080 sightseers, 2,480 fishermen, and 2,320 other.
6. Totals of primary activities not including overlaps or other activities. Clarke and Rapuano calculated Phase I design load is 40,585, and Phase III design load is 109,987.

Table 18-8, above, indicates that swimming, boating, camping and picnicking account for the majority of DWGNRA recreation activities. This is in direct accord with recreation activity preferences (see Table 18-7). The analysis of the relative facilities mixes of DWGNRA plans found in Table 18-9 below, provides many useful points of comparison.

Table 18-9 DWGNRA Recreation Plans Summary: Relative Facility Mixes

	Non-TILP Plans		TILP Plans	
	NPS	SDC <sup>2</sup>	Phase I	Phase III
Swimming	9.3%	15.6%	40.2%	14.0%
Boating	10.9%	9.5%	7.9%	6.5%
Camping	19.6%	15.2%	7.0%	20.8%
Picnicking	27.2%	17.3%	27.7%	47.0%
Other <sup>1</sup>	33.0%	42.4%	17.2%	11.7%
Total	100.0%	100.0%	100.0%	100.0%

Notes:

1. Includes all other activities other than those listed above.
2. Assumptions from Save The Delaware Concept Plan, pg. 48.
3. Source: Table 18-3 assumptions.

Source: Table 18-8.

The above TILP and non-TILP facility mixes consider the four activities of swimming, boating, camping and picnicking with hiking grouped with "other" activities. These other activities have been quantified for the NPS Plan (see Table 18-6) but assumptions have been made for the SDC and TILP Plans (see Table 18-1 through 18-5). With these assumptions as a basis, a comparison of the Clarke and Rapuano Plan and Save The Delaware Coalition Plan visitation

mix can be undertaken.

Clarke and Rapuano envision an ultimate design load consisting of swimming 14.0%, boating 6.5%, picnicking 47.0% and camping 20.8%. Of particular significance is that Phase I activity mix will contain a 40.2% swimming component. This is due to the strategy of constructing most swimming facilities in Phase I. These four activities consist of 82.8% in Phase I and 88.3% in Phase III of the entire DWGNRA with TILP design load and hence are considered primary in the DWGNRA with TILP Plan.

Save The Delaware Coalition envisions a differing design load balance, with these primary activities accounting for only 57.6% of all non-TILP/DWGNRA usage. A design load is determined for all facilities by dividing daily park usage by a daily facilities turnover rate. Results are proportionally allocated assuming total park usage equals 100% of daily visitors. From the previous table, swimming would consist of 15.6%; boating 9.5%, camping 15.2%, and picnicking 17.3% of total park usage. More importantly, the differing lengths of the recreation season for the SDC facility mix due to the emphasis on what are secondary activities in the Clarke and Rapuano Plan (sightseeing, bicycling, fishing, etc.) reduces the summer Sunday peaking effects of the Phase I Clarke and Rapuano mix which emphasizes swimming and boating.

Of significance for comparative purposes, is the fact that the mixes of both the Clarke and Rapuano Phase I Plan and the SDC Plan are both predicted on an assumed annual visitation of 4,000,000. Clarke and Rapuano envision 40.2% swimming with Phase I TILP, while Save The Delaware Coalition envisions 15.6% without TILP.

For DWGNRA with TILP in Phase I, Clarke and Rapuano envision 2,365,000 annual swimming visitation based on their formula of annual visitation x 1.04% equals design load. For annual swimming visits in the non-TILP scheme, using the above assumptions, the SDC Plan provides for 407,000 annual swimming visitation (See Table 13-6). The above analysis shows a net increase of 1,958,000 DWGNRA annual swimming visits attributable to construction of TILP in Phase I, assuming four million total annual visitations. The above shows the importance of swimming in the determination of both DWGNRA's visitation mix and annual visitation level. As boating is related to the number of water acres available, a similar analysis would reveal its equivalent importance as a visitation determinant.

Table 18-9 illustrates a high degree of consistency in facilities mixes in the NPS and SDC Plans. Boating, for all the plans, falls within the relatively narrow range of from 6.5% (TILP III) to 10.9% (NPS) of total instant capacity. Camping also falls within a narrow range of 15.2% (SDC) to 19.6% (NPS). The low TILP I amount reflects TILP facilities staging priorities. Picnicking falls within a narrow range of 17.3% (SDC) to 27.7% (TILP I), excepting TILP III. The high TILP III percentage is due primarily to the abundance of lake edge beaches and additional lake edge picnicking.

A key difference between the TILP and non-TILP plans lies in use of lowland areas. Trail use (hiking, biking and horseback riding), sightseeing (historic structures, interpretive and educational facilities, and cultural attractions), and fishing comprise the bulk of "other" non-TILP activities. In both the NPS and SDC Plans, these activities and others, which occur primarily in lowland areas, replace swimming.

#### XVIII.E.2 ALTERNATIVE DWGNRA's VERSUS COMPARABLE STATE AND NATIONAL RECREATION FACILITIES

The intensity of annual visitations per acre per year provides a consistent basis for comparing the quality of the recreation experience offered by potential DWGNRA's. Without doubt, crowding is a key detriment to the type of recreation experience people seek in visiting areas of natural beauty such as DWGNRA. (See IV.B.3(d)).

- Intensity of use provides a basis for comparing the quality of the recreation experience offered by DWGNRA plans with comparable parks. The range of visitors per acre per year illustrated in Table 18-10, below, may be broadly structured into low, medium and high ranges for comparative purposes.

**Table 18-10 Visitation Intensity of Alternative DWGNRA Recreation Plans and Comparable State and National Recreation and Historic Facilities**

<u>Comparable Parks</u>	<u>Gross Acreage<sup>1</sup> (incl. water impoundments)</u>	<u>Annual Visits<sup>1</sup> (x 1000)</u>	<u>Annual Visits per Gross Acre</u>	<u>Intensity Range</u>
Yellowstone N.P. Wyo., Mont., Idaho	2,219,823	1,938	.87	low
Yosemite N.P., Calif.	761,094	2,343	3.10	low
Fire Island N.S., N.Y.	19,311	550	28.50	medium
Harriman S.P., N.Y.	46,181	2,450	53.10	medium
Allamuchy S.P., N.J.	21,502	816 <sup>2</sup>	37.90	medium
Hopatcong S.P., N.J.	12,372	395 <sup>2</sup>	31.90	medium
Kinzua Dam S.P., Pa.	26,226	1,926 <sup>3</sup>	73.40	medium
Saratoga N.H.P., N.Y.	2,432	284	116.78	high
Beltzville S.P., Pa.	3,007	431	143.30	high
Pyamatuning S.P., Pa.	25,833	4,074 <sup>4</sup>	157.70	high
Gettysburg N.M.P., Pa.	3,910	1,354	346.29	high
Morristown N.H.P., N.J.	1,544	975	631.48	high
Valley Forge S.P., Pa. <sup>5</sup>	2,255	1,800	798.23	high
Yorktown N.C., Va.	3	2.9	966.67	high
<b>DWGNRA</b>				
Current DWGNRA	40,750 <sup>6</sup>	671 <sup>7</sup>	16.47	medium
NPS Plan <sup>8</sup>	72,000	1,652	22.94	medium
SDC Plan	72,000	3,863 <sup>9</sup>	53.65	medium
TILP Phase I Plan	72,000	4,000	55.55	medium
TILP Phase III Plan	72,000	10,600	147.22	high

Notes:

1. Source: National Park Service Office of Statistics, Washington, D.C., 1974 figures.
2. 1971 figures.
3. 1972 figures.
4. 1973 figures.
5. Source: Horace Wilcox, Pennsylvania Historical and Museum Commission, Valley Forge, Pa.
6. Source: NPS, Philadelphia, Pa.; 40,000 acres for hunting, 750-800 acres intensively used in swimming beaches, environmental education centers, etc., including Corps land under NPS administration.
7. Source: same as 1. above, plus Estimated Canoe Usage on the Delaware River, Milford to Port Jervis, by National Park Service, Philadelphia, Pa.
8. Source: NPS Philadelphia, May 5, 1975, Table 18-6.
9. Source: Table 13-6 Capacity and Visitation of DWGNRA Without TILP.

N.P. - National Park  
S.P. - State Park  
N.S. - National Seashore

N.H.P. - National Historic Park  
N.M.P. - National Military Park  
N.C. - National Cemetery

Table 18-10, above, shows that the NPS Plan provides a less intense DWGNRA than comparable nearby parks including Harriman, Allamuchy, Hopatcong, and Kinzua Dam. The SDC Plan falls near the bottom end and TILP Phase I near the top end of the "medium" range represented by these parks. TILP Phase III falls within the "high" range, defined by Beltzville and Pyamatuning State Parks.

Table 18-10 illustrates that DWGNRA, developed under the NPS Plan, is likely to provide a somewhat higher quality of experience than that available at Harriman, Allamuchy, Hopatcong, or Kinzua Dam, and similar state parks. The SDC and TILP Phase I Plans envision "medium" visitor densities, within the range established by these parks. Hence, a similar quality of experience is likely. TILP Phase III envisions a significantly higher intensity of use, notable in its similarity to Beltzville and Pyamatuning State Parks. While both contain large impoundments, these parks are significantly smaller in gross area. DWGNRA's relatively enormous size (three times the size of Pyamatuning and 23 times the size of Beltzville) would severely aggravate congestion and other problems existing in parks whose visitation represents the high end of the spectrum.

It is informative to compare the alternative plans for DWGNRA with various historical areas some of which are similar in concept to DWGNRA's proposed mix of cultural, natural and recreational resources. Their relative popularity is indicated by noting that they all fall within the high intensity range on Table 18-10. However, these facilities are generally developed in much denser configurations with higher levels of access and smaller proportions of open space. In most cases annual visitation to these facilities have been increasing markedly, except for Gettysburg and Saratoga. Potential problems in visitation numbers may exist with the recent change in counting techniques rendering some of this

comparative analysis difficult. For example, the Gettysburg National Cemetery of only 21 acres, had an estimated annual visitation of 2.5 million in 1974, in comparison with the Gettysburg National Military Park of nearly 4000 acres annual visitation of 1.4 million. The cemetery is the site of Lincoln's Gettysburg Address, however, some "double counting" with the military park is likely. Yorktown National Cemetery's high visitation could be the result of substantial "pass through" traffic on the Colonial National Parkway and Route 17.

Of all the historic parks, Valley Forge is perhaps the most comparable, as Morristown provides no recreation and Saratoga, Gettysburg and Yorktown are relatively distant from major urban centers. Valley Forge's annual visitation estimate of nearly 2 million is based on a visitors count into the historic buildings times a factor for the use of the recreational facilities and open space. The park's visitation for 1975 is up 50 percent over last year due to interest in the Bi-Centennial and an increased emphasis on interpretive facilities. Valley Forge provides two major historic areas, the Grand Parade Ground and a restoration of Washington's Headquarters along with major picnic areas, hiking, biking and horseback riding facilities, limited boating and fishing but no swimming. No structured recreation facilities are provided, rather well-maintained open space and limited service concessionaires of food, internal bus and bicycle rentals.

Several years ago all of Valley Forge was considered a recreation area. It is presently conceived of as an "outdoor museum" of the encampment of the Colonial Army under Washington with recreational areas in their least obtrusive locations on the periphery. In this aspect it differs from DWGNRA which is the reverse - local historic interests within a large recreational and natural preserve.

However, the point to be made is that proper site planning and design can solve most of the conflicting aspects of adjacent historic, preserved open space and recreational land uses.

#### XVIII.E.3 ALTERNATIVE DWGNRA IMPACTS ON THE SEVEN COUNTY REGION

The following discussion summarizes alternative DWGNRA's and analyzes impacts on the contiguous seven county area. The discussion draws heavily from findings and methods presented in Chapters I, XIII, XVI, XXII, and XXV. The discussion presents a summary overview of all recreation impacts. First, the annual visitation spectrum, ranging from 1,652,000 (National Park Service Plan) to 10,600,000 (Clarke and Rapuano Phase III) is defined relative to participation rates. Secondly, nineteen impact criteria covering the major issue areas critical to the maintenance of the public health, safety and welfare of the seven county area are established. These are the same criteria used to evaluate recreation alternatives in Chapter XIII. Both qualitative and quantitative impacts for each individual criterion are then defined and discussed. Thirdly, the entire range of impacts is structured in a summary matrix format based on the magnitude of impacts.

The discussion is limited solely to primary and secondary DWGNRA impacts in the seven county area, with existing conditions forming the baseline against which impacts are measured relatively. Value judgments and rankings have been made based on an appreciation of present conditions within the seven county area. Impact rankings range from highly positive to highly negative as follows:

- highly positive
- moderately positive
- minimally positive
- little or none
- minimally negative
- moderately negative
- highly negative

It is important to note that impact rankings are not considered consistent between individual criterion because each has a unique impact in type and magnitude. In quantifiable impacts, absolute quantities, such as additional pounds of solid waste, are discussed relative to the existing situation, i.e., the amount of solid waste presently being generated. In qualitative impacts, emphasis is placed on the relative impacts on long term area-wide development goals.

Both the extent and severity of individual impacts have been considered in making impact value judgments. A positive or negative judgment occurs when impacts have benefits or costs measurable in terms of the present or future overall quality of life of inhabitants of the seven county impact area.

Impact criteria listed along the vertical axis of the matrix include:

A. Balanced Development

1. Preservation of open space
2. Achieve land use objectives
3. Achieve transportation objectives

B. Social

1. Promote existing values and lifestyles
2. Preserve historical and archeological sites
3. Minimize displacement of people and businesses

C. Economic

1. Generate local employment opportunities
2. Generate local retail and service expenditures
3. Increase local property values.

D. Institutional

1. Minimize local government public service needs
2. Increase property and sales tax base
3. Ability of local government to handle growth

E. Natural Environment

1. Minimize flora and fauna disturbance
2. Minimize solid waste generation
3. Minimize air, water and noise pollution

F. Recreation

1. Provide needed facilities
2. Provide high quality experience

**Table 18-11 Summary Impact Matrix on Seven County Area - Alternative DWGNRA Plans**

		NON-TILL PLANS			TILL PLANS		
		NPS/AMC		SDC	PHASE I		PHASE III
Criteria	Impacts	Impacts	Impacts	Impacts	Impacts	Impacts	Impacts
A.	B. Social Development	C. Economic Development	D. Social Development	E. Economic Development	F. Social Development	G. Economic Development	H. Social Development
1. Open space	moderately positive	minimally positive	minimally positive	minimally positive	minimally positive	moderately negative	moderately negative
2. Land use objectives	little to none	minimally negative	minimally negative	minimally negative	minimally negative	moderately negative	moderately negative
3. Transport. objectives	minimally negative	minimally negative	moderately negative	moderately negative	moderately negative	moderately negative	moderately negative
1. Values and lifestyles	little to none	little to none	moderately negative	moderately negative	minimally negative	moderately negative	moderately negative
2. Historical/archeo. sites	highly positive	highly positive	moderately negative	moderately negative	highly negative	highly negative	highly negative
3. People and businesses	moderately negative	moderately negative					
1. Employment opportunities	minimally positive	moderately positive	moderately positive	moderately positive	highly positive	highly positive	highly positive
2. Retail/service expenditures	little to none	minimally positive	moderately positive	moderately positive	highly positive	highly positive	moderately positive
3. Property values	minimally positive	moderately positive	moderately positive	moderately positive	moderately positive	moderately positive	moderately positive
1. Public service needs	little to none	minimally negative	moderately negative	moderately negative	moderately negative	moderately negative	moderately negative
2. Tax base	minimally positive	minimally positive	moderately negative	moderately negative	minimally positive	moderately positive	moderately positive
3. Ability to handle growth	moderately negative	moderately negative			moderately negative	highly negative	highly negative
1. Flora/fauna disturbance	little to none	minimally negative	minimally negative	minimally negative	highly negative	highly negative	highly negative
2. Solid waste generation	minimally negative	minimally negative	minimally negative	minimally negative	moderately negative	moderately negative	moderately negative
3. Air/water/noise pollution	minimally negative	minimally negative	minimally negative	minimally negative	moderately negative	moderately negative	moderately negative
1. Needed facilities	little to none	little to none	moderately positive	moderately positive	minimally positive	moderately positive	moderately positive
2. High quality experience	highly positive	highly positive			minimally positive	minimally positive	minimally positive

Criterion A.1 Preservation of Open Space

Open space impacts of alternative DWGNRA's are determined by assessing the amount of land development induced by various visitation loads, development being the inverse of open space preservation. Table 18-12, below, indicates the total amount of residential and non-residential development attributable to alternative DWGNRA's.

Table 18-12 Induced Development Potentials of Alternative DWGNRA Plans

	<u>Without TILP</u>		<u>With TILP</u>	
	<u>NPS</u>	<u>SDC</u>	<u>PHASE I</u>	<u>PHASE III</u>
Permanent Residential Acreage <sup>2</sup>	444	1,211	1,500	4,837
Non-residential Acreage	303	828	1,025	1,599
+20% of above: roads, schools, utilities, etc.	<u>149</u>	<u>408</u>	<u>505</u>	<u>1,287</u>
Gross Developed Acreage	896	2,447	3,030	7,723

Notes:

1. Assumed proportional to visitation, TILP Phase I.
2. Source Table 22-81

Table 18-13, below, compares this acreage with the amount of open space in the seven county area. The gross developed acreage has been translated into square miles.

Table 18-13 Induced Development Relative to Existing Development

	<u>WITHOUT TILP</u>		<u>WITH TILP</u>	
	<u>NPS</u>	<u>SDC</u>	<u>Phase I</u>	<u>Phase III</u>
Total Development in Seven County Area (in square miles) Induced by Each Plan <sup>1</sup>	1.40	3.82	4.73	12.07
1974 Developed Acreage in Seven County Area (in square miles) <sup>2</sup>	393.08	393.08	393.08	393.08
% Increase in Developed Acreage Due to DWGNRA Plans	.36	.97	1.20	3.07

Notes:

1. Source: Table 18-12.
2. Source: Table 22-69.

DWGNRA by itself preserves 72,000 acres or 112 square miles, removing them from private and public development pressures. This in combination with its relative amount of induced development results in a moderately positive impact for the NPS Plan, a minimally positive assessment for the SDC and TILP Phase I Plans and a moderately negative impact for TILP Phase III due to its higher level of induced development.

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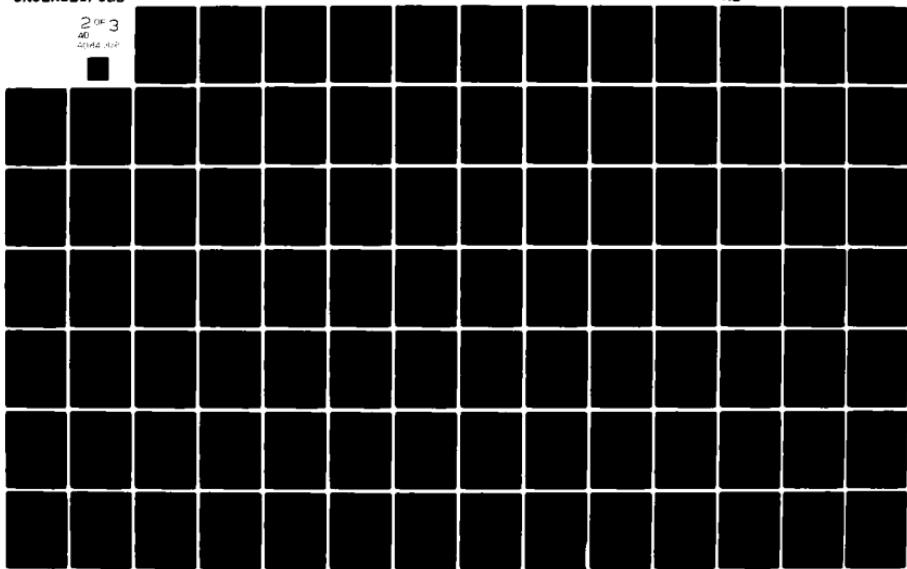
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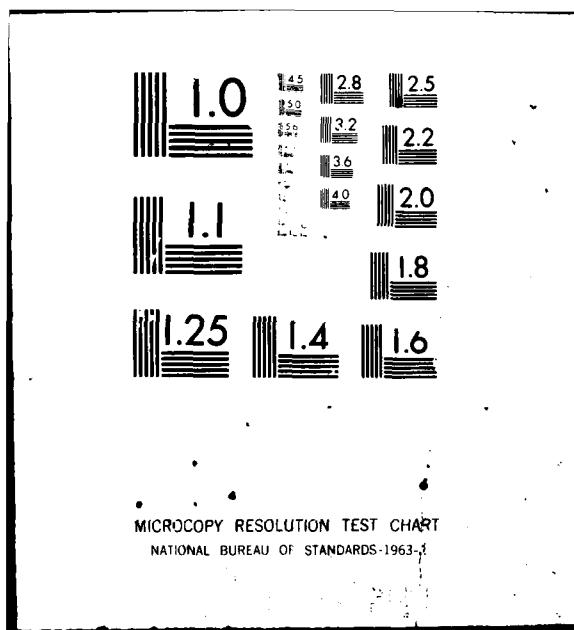
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Criterion A.2 Land Use Impacts

Three of the most important objectives underlying land use planning in the seven county area include: maintaining residential physical character and quality, retaining commercial/industrial areas, and promoting balanced growth consistent with utility capability. DWGNRA's effect on these is directly related to the visitation rates of each alternative and the extent to which land use controls regulate growth (see XXIII.C.). This discussion assumes minimal land use controls in estimating the differential impacts of alternative DWGNRA's.

In each DWGNRA plan, growth will occur near main park entrances and along major highways. DWGNRA related growth will be greatest under TILP Phase III, and proportionately less under other alternatives. (The geographic distribution of impacts is identified in Chapter XXII).

Residential area character and quality will be adversely affected by road improvements, traffic congestion, traffic noise, and intruding commercial land uses. Thus TILP Phase III will have a moderately negative impact in areas along major access routes with proportionate decreases in Zones 2, 3, and 4. (See XXII.C.)

Most municipalities have expressed desires to limit strip commercial development. While DWGNRA related growth is most likely to locate near highways, the relatively smaller amount of growth generated by the NPS and SDC Plans will have little impact. TILP Phase I would have a minimally negative affect in Impact Zone 1 and TILP Phase III would have a moderately negative impact in Zones 1 and 2.

Since visitor loads will increase gradually over a relatively long period of time under all alternatives but TILP Phase III, municipalities will have time to balance utilities development with growth. Therefore, only TILP Phase III will

have a negative impact on this goal, the others will have a minimal or little or no effect.

The above discussion indicates that impacts will be proportional to visitation. Accordingly, NPS impact is ranked as little or none, SDC and TILP Phase I impacts are ranked as minimally negative, and TILP Phase III impacts are ranked as moderately negative.

Criterion A.3 Transportation Objectives

It can be assumed that the private automobile will be the prime transportation mode to and from DWGNRA under all four recreation alternatives. DWGNRA will reinforce the commitment to use of the private automobile to the extent that road improvements correspond to the demands of park generated traffic.

The increased traffic generated by TILP Phase III will have a highly negative impact on congestion during summer months in the areas defined in Chapter XXV. TILP Phase I, SDC, and NPS Plans will have a minimally negative impact primarily where they increase traffic in already congested areas. The added increments of air and noise pollution associated with increased traffic will constitute a negative impact. TILP Phase III's increment is significantly greater than all other Plans due to the vehicle trips generated and the unlikely provision of necessary road improvements.

The relocation of Route 209, that would accompany TILP and all alternatives, constitutes a minimally positive impact on the transportation system in Pennsylvania. As discussed in Chapter XIX, relocation plans would be contingent on the availability of funds if Pennsylvania has to bear a large portion of the financial burden.

#### Criterion B.1 Existing Values and Lifestyles

The existing lifestyle in the seven county area will be affected by traffic congestion, concentrations of induced recreation related facilities, and destruction of the natural environment. Hence, its impact assessment is considered a summation of the above three factors. Increases in traffic congestion will disrupt normal activity patterns and inconvenience permanent residents and will occur near park entrances and in the major population centers of the Stroudsburgs, Port Jervis-Matamoras area, and Newton. The traffic projections for TILP Phase III described in Chapter XXV, suggest that this alternative would have a moderately negative impact in these areas without substantial traffic improvements. In comparison, TILP Phase I, NPS, and the SDC alternatives will have a minimally negative impact. These judgements are based on existing conditions. It is assumed that the relatively higher traffic volumes generated by TILP Phase III would accelerate the necessary road improvements and hence, existing congestion problems would be reduced sooner than under the other alternatives.

Concentrations of induced recreation related facilities such as hotels, motels, shops and restaurants in existing towns or along roads would change the character of the area with greatest changes occurring in undeveloped areas of Sussex, Warren and Northampton Counties, which have little recreation related development at the present time. The number of hotels, motels, and commercial establishments generated by TILP Phase III, will have a moderately negative impact in these areas; TILP Phase I will have a minimally negative impact; while SDC and NPS will have little or no impact.

The destruction of the natural environment is directly proportional to the land consumed by secondary growth which occurs in undeveloped areas. These are discussed under criterion A.1 The amount of land consumed by TILP Phase III induced development, will have a moderately negative impact on the natural environment in ecologically sensitive areas. TILP Phase I will have a minimally negative effect and in comparison to projected area growth, the NPS and SDC Plans will have little or no effect. The fact that impacts would be distributed over the seven county impact area has been considered in determining the aggregate impact on lifestyles in the region.

Criterion B.2 Preserve Historical and Archeological Sites

The comprehensive accounting of DWGNRA historic structures contained in Table 22-134 and summarized below in Table 18-14 indicates that of the 458 total, 265 may be removed after salvage. Of the remaining 193 structures, 70, or 36 percent are located within the TILP pool area. Of the 29 sites within DWGNRA eligible for nomination to the National Register, 8, or 28 percent are within the TILP pool area.

Table 18-14 Historic Structures Within DWGNRA

	<u>Pool Area</u>	<u>Non-Pool Area</u>	<u>Total</u>
Total Historic Structures <sup>1</sup> Recorded in 1967 and 1974 Surveys	256	202	458
Structures Lacking Historical <sup>2</sup> or Architectural Value Which May Be Removed	141	68	209
Structures Which May Be <sup>3</sup> Removed After Salvage of Significant Materials	45	11	56
Total Removable Structures	186	79	265
Net Historic Structures	70	123	193

Notes:

1. Source: Table 22-134 Recommended Action For Historic Structures Within DWGNRA
2. Category V, Table 22-134.
3. Category VII, Table 22-134.

In summary, a river-based park would preserve many historical buildings in the original setting. The reservoir-based park will require movement and restoration of a number of buildings. The original sites noted above and in XXII.C.5(b) are of historical interest, and the same value is not preserved by transporting these structures to other locations. In addition, some one hundred archeological sites would not be inundated in a river-based park. These sites go back to Paleo-Indians, 10,000 B.C. and have a continuing record of activity in the area through the Shawnee and Delaware Indians and the Colonial development. (See XXII.C.5(a)). In addition, a river-based park would preserve access to a variety of fossil remains, particularly abundant samples being found near Dingmans Ferry and Broadhead Creek.

In light of the above impacts, the TILP Phase I and Phase III Plans are assessed as highly negative. Both Plans for non-TILP DWGNRA's will enhance appreciation of historic structures and archeological sites and accordingly, the NPS and SDC Plans are ranked as highly positive.

Criterion B.3 Minimize Displacement of People and Businesses

The following table is an updated status report of the land acquisition process for DWGNRA.

Table 18-15 DWGNRA Permanent Dwelling Unit Acquisition

<u>Property Type</u>	<u>Total Properties To Be Acquired</u>	<u>Total Dwelling Units To Be Acquired</u>
Year round residences	871	827 <sup>1</sup>
Seasonal residences	1,551	- <sup>2</sup>
Farms	105	84 <sup>3</sup>
Commercial properties	92	30 <sup>4</sup>
Resorts and motels	40	20 <sup>5</sup>
Total		961

Source: Corps of Engineers, Real Estate Office, Philadelphia Telcon  
May 20, 1975.

Note: These totals are updates of those used in Table 11-3, Breakdown of Land Acquisition By Property Types According to Real Estate Design Memoranda and Gross Estimates. Only those classifications useful in the evaluation under this criterion are indicated.

Notes:

1. assumes 5% vacancy rate, 1 dwelling unit per property
2. assumes no year round occupancy
3. assumes 80% contain 1 dwelling unit
4. assumes 33% contain 1 dwelling unit
5. assumes 50% contain 1 dwelling unit

Of the total, 961 families will require relocation due to DWGNRA. Of this total, 333 or 34.7 percent have already received relocation benefits under PL 91-646 or Title 10. Assuming these families have moved out of the acquisition area, this leaves 628 or 63.3 percent of total families to be displaced still occupying residences within DWGNRA. Of these families, 395 are living under year to year leases on properties already acquired by the Corps. This leaves 233 families living on properties as yet unacquired for DWGNRA.

While DWGNRA with TILP will require relocation of all these families, DWGNRA without TILP (the NPS and SDC Plans) will eventually require relocation of most.

Such actions would occur over an extended period in accord with PL 89-158. (See also XI.E.2(a)). Accordingly, relocation impacts of the NPS and SDC Plans are ranked as moderately negative, and those of TILP Phase I and III as highly negative.

Criterion C.1 Generates Local Employment Opportunities

Table 18-16, below, indicates a range of net employment increases over 1974 levels from .203% to 2.11%. Adding an average of 575 TILP construction jobs (See Table 22-17) for eight years will only increase by .201%, the total seven county job supply. If local hiring is carried out, these TILP jobs would only directly employ a maximum of 3.1% of the seven county area's 1974 construction work force of 18,750 (See XXII.C.2(d)).

Table 18-16 Employment Impacts of The Alternative DWGNRA Plans

	<u>WITHOUT TILP</u>		<u>WITH TILP</u>	
	<u>NPS</u> <sup>1</sup>	<u>SDC</u> <sup>1</sup>	<u>Phase I</u>	<u>Phase III</u>
Annual Visitors	1,185,000	3,230,000	4,000,000	10,600,000
Total Permanent <sup>2</sup> Jobs Generated	536	1,462	1,810	5,730
Total Seasonal <sup>3</sup> Jobs Generated	45	121	150	300
Total Annual <sup>4</sup> Employment Generated	581	1,583	1,960	6,030
Total Employment <sup>5</sup> in Seven County Area, 1973	286,000	286,000	286,000	286,000
DWGNRA Increment as Percent of Seven County Total	.203%	.553%	.685%	2.108%

Notes:

1. Assumed proportional to TILP Phase I.
2. Table 22-22, Page XXII-78.
3. Table 22-23, Page XXII-79.
4. Table 22-24, Page XXII-80.
5. Source see Page I-68.

The above discussion leads to the conclusion that DWGNRA will have a minimally positive overall effect on employment in the seven county area. The NPS, SDC, and TILP Phase I Plans are assessed as producing moderately positive impact, while TILP Phase III produces a highly positive impact.

Criterion C.2 Generates Local Retail Sales

The following table indicates that DWGNRA will add from +.80% to +7.92% net increases to the seven county retail and services sector over the long run. Not counted are the short term effects of DWGNRA and TILP construction.

Table 18-17 Impacts of the Various DWGNRA Plans on Retail and Service Business

	<u>WITHOUT TILP</u>		<u>WITH TILP</u>	
	<u>NPS</u> <sup>1</sup>	<u>SDC</u> <sup>2</sup>	<u>Phase I</u>	<u>Phase III</u>
Annual Visitation (000's)	1,185	3,230	4,000	10,600
Total Projected <sup>2</sup> Annual Sales Generated by DWGNRA Visitors Excluding Lodging (000's)	\$ 8,899	\$24,257	\$30,040	\$86,652
Total Existing <sup>3</sup> Annual Sales Excluding Lodging in Seven County Area (000's)	\$ 1,587.8	\$ 1,587.8	\$ 1,587.8	\$ 1,587.8
DWGNRA Sales as Percent of Seven County Total	.56%	1.53%	1.89%	5.46%
Sales Due to New <sup>4</sup> Residents Caused By DWGNRA as a Percent of Seven County Total	.24%	.64%	.80%	2.46%
Total Increased Retail and Service Business Due to DWGNRA as a Percent of 1972 Level	+ .80%	+2.17%	+2.69%	+7.92%

Notes:

1. Assumed proportional to TILP Phase I.
2. Source: Table 22-21, Page XXII-76
3. Source: Sales Management Magazine, 1972, Survey of Buying Power.
4. Assumed proportional to population increases.

The estimated \$115,000,000 construction cost of the Tocks Island Dam is likely to generate approximately \$40,000,000 in direct expenditures for construction related goods and services within the seven counties. Assuming an equal distribution over the eight year construction period, approximately \$5,000,000

would be contributed annually to the seven county area economy. Of course, in actuality, the level of expenditures will slightly lead the build-up and fall-off of construction employment and payroll (estimated in Table 22-16 and 22-17) which peak in the seventh year of the eight year construction period. This increase in the goods and services sector is a minor increment of the total envisioned increases due to normal population growth projections unrelated to DWGNRA and TILP.

The impact assessments for the range of increases to the retail and service sectors runs from little to none for the NPS Plan, minimally positive for the SDC Plan and TILP Phase I Plan, to highly positive for the TILP Phase III Plan.

#### Criterion C.3 Increase Local Property Values

The overall average impact on property values in the seven county area due to the various alternative DWGNRA Plans is likely to be proportional to population increases. This is because the additional maximum of 6,000 people attracted to the seven county area by 1985 (TILP Phase I) as a result of DWGNRA, out of a total population of 737,000 (See XXII.C.2(i)(2) Tax Base) will have very little impact.

Residential property value impacts will be high in those townships which experience greatest population increases and in those more rural areas which are able to remain undisturbed. Commercial property values will increase dramatically in commercially zoned lands, particularly along DWGNRA access routes. For the above reasons, total property value impacts of the NPS Plan are assessed as minimally positive and the SDC Plan and TILP Phase I and Phase III Plans as moderately positive.

Criterion D.1 Minimize Local Governmental Service Needs

Public services including police, fire, emergency medical and road maintenance constitute the key DWGNRA public service impact areas on the seven county region. Public utility requirements, another form of services, is considered in criterion E.2 under environmental impacts. Here, the question of impact is reduced to whether additional equipment and manpower requirements generated by DWGNRA will create public safety vacuums and service problems in the seven county area.

Increase in crime protection is seen as secondary to increased traffic control as the major police service requirement (See XXII.C.4(a)(1) Summary of TILP Impacts.) New Jersey has available manpower through retention of the Hainesville Station, and New York envisions no major traffic control problems from DWGNRA. In Pennsylvania, a cooperative agreement among local police departments in the Stroudsburgs, is expected to provide adequate manpower for their future local needs. Local departments elsewhere provide minimal services and depend on the State Police which is presently understaffed.

A shortage of water is the key fire protection problem in the seven county area (See XXII.C.4 (a)(2)Summary). Presently, with the exception of Pike County, there is adequate fire fighting equipment and manpower within the seven county region. The additional rough terrain equipment required by DWGNRA could be provided as an NPS capital expenditure. This equipment would result in a net increase in fire protection capabilities within the seven county region.

Regarding public health services (See XXII.C.4(a)(3) Summary) the seven county region presently contains adequate ambulance services and adequate hospital beds for all envisioned DWGNRA's. As such, the first aid facilities provided within DWGNRA will result in an overall net increase in public health service capabilities.

The above discussion concludes that the significant public safety impacts of DWGNRA on the seven county area will be the increased need for traffic control and fire and health services equipment. TILP, if built, will also result in minimal alleviation of water shortages for firefighting. As all of the DWGNRA alternatives place some burden on local public services no matter how small, and do not totally provide adequate manpower and equipment for their induced visitation as part of their management plan, all impact assessments fall in the negative range. Accordingly, as some of these fire and health services will be provided by DWGNRA, the impacts from the SDC Plan are assessed as minimally negative and from the TILP Phase I and Phase III Plans as moderately negative due to the increasing traffic and crime control requirements. Visitations from the NPS Plan will have little or no impact on the above mentioned public services.

Criterion D.2 Increase Property and Sales Tax

To the degree that population increase will have a direct relationship to increases in tax revenues, the estimated 1985 population increase in the seven county area due to DWGNRA and TILP is less than 1 percent and results in minimal increases in local tax revenues. At its ultimate maximum development DWGNRA and TILP will induce a 5 percent increase in population in some areas.

The additional maximum of 6,000 people attracted into the area by 1985 as a result of Phase I of TILP and DWGNRA, out of a total present seven county area population of 737,000 (see XXII.C.2(1)(2)) will have very little impact on the total tax base of jurisdictions in the area. The seven county area as a whole is projected to increase its population by 157,000 or 21.3 percent over the 12-year period from 1975 to 1985. (See Table A-1 and A-9; Appendix to Chapter I.)

Municipal land use control changes to accommodate this growth, which represent continuation of past trends, will enable the accommodation of the additional 6,000 person population increment due to DWGNRA, with minimal adverse impact.

The above population changes render DWGNRA induced tax base changes as minimal for the NPS, SDC, and TILP Phase I Plans in the seven county area. The impact of the TILP Phase III Plan will be moderately positive due to the estimated 18,000 person population induced solely by TILP/DWGNRA, (see Table 22-40) and its corresponding increases in the seven county tax base. There is no question that concentrated growth in particular municipalities will cause impacts from each DWGNRA Plan. Figure 22-11 indicates the location of these impacted communities. They include the following which have minimal land use controls: Westfall, Delaware, Upper Mt. Bethel, Washington, Blooming Grove and Milford. The net tax base effect will be positive in those municipalities where commercial assessments exceed residential assessments; the former, having less costly service requirements. It is assumed that none of the alternative DWGNRA Plans will induce blight and hence all tax base impact assessments are considered positive.

#### Criterion D.3 Ability of Local Government to Handle Growth

The existence and adequacy of land use controls is considered the prime measure of a local jurisdiction's ability to handle growth. The status of land use controls in those municipalities projected to be highly impacted within the seven county area is determined by comparing Figure 22-11, Page XXII-199 (Land Use Impacts) with Figure 23-1, Page XXIII-34 (Municipalities With and Without Zoning and/or Subdivision Controls). High growth municipalities without either zoning or subdivision controls are all located in Pennsylvania. These include

Westfall, Delaware, Upper Mt. Bethel, Washington, Blooming Grove, and Milford. Many of DWGNRA external land use impacts will occur in Pennsylvania where only three such municipalities contiguous to DWGNRA have minimally adequate controls (Dingman, Smithfield and Delaware Water Gap). Negative impacts will occur in these townships in proportion to the level of visitation and the township's ability to provide easily developable land. Thus, the NPS, SDC, and TILP Phase I Plans are considered to cause moderately negative impacts and the TILP Phase III Plan will cause highly negative impacts on these communities in particular.

Criterion E.1 Minimize Flora and Fauna Disturbance

The existing environment will experience pressure caused by an influx of visitors to the DWGNRA without TILP. The two existing park plans based upon a free flowing river call for a range of 1.2 to 3.2 million annual visitors, and 18,000 to 40,000 maximum daily visitors. The NPS Plan is expected to establish visitor centers, hiking trails, and support facilities which will give order to the visitor flows.

The expected range in annual and daily visitation levels will initially impact the environment which will in turn seek a new state of equilibrium. Those faunal species unable to withstand human pressure will relocate on the fringes of the population centers. If construction of support facilities is kept at a minimum, much of the existing essential habitat will remain.

People will trample vegetation where allowed by negligence. Proper planning of population centers and maintained trails by the NPS will insure the survival of the less resistant but unique vegetation of the area. The size of some floral

communities of the area would be reduced but the diversity could thereby be maintained.

Construction of DWGNRA with TILP will eliminate approximately 12,000 acres of habitat. Construction impacts are analyzed in Chapter X.A. Operational impacts considering the visitor loads suggested by Clarke and Rapuano Phase III (10,600,000 annual, 135,000 maximum daily) will heavily impact the remaining area (not inundated with the DWGNRA). Discussions of the impacts upon the fisheries and wildlife and vegetation due to creation of TILP can be found in Chapter IX.B., C., and E., and Chapter XXII.

In general, the activities of people visiting the park with or without TILP will conflict with the existing wildlife; recreation and service facilities will supplant habitats or change their character. The park with the reservoir will have much more substantial effect on the environment, as it will be radically changing the nature of a large part of the area. Also, the difference between a maximum of 4,000,000 visitors with a river and an ultimate 10,600,000 visitors with a lake is substantial considering that the outer boundaries of the DWGNRA are not expanded with TILP but 12,000 acres are removed from the access through inundation.

A detailed environmental analysis of DWGNRA with and without TILP can be derived from the matrices of Chapter XVI.C. by comparing the TILP column with the Program C column; the former contains the recreation component of DWGNRA with TILP and the latter contains DWGNRA without TILP.

The above discussion leads to the assumption that this impact will be proportional to level of visitation. Accordingly, the NPS Plan will have little to no impact,

and the SDC Plan will have a minimally negative impact. Because of the severe change due to the lake, both TILP alternatives are assumed to have a highly negative impact. Vegetation would be stripped from the 12,000 acre lake bed area and the additional sites required for structured recreational facilities. This is one and one-half times the ultimate 7.723 acres of induced development within the seven county area due to TILP Phase III. (See Criterion A.1).

Criterion E.2 Minimize Solid Waste Generation

The table below shows that the solid waste impact generated by the NPS, SDC, and TILP Phase I Plans will be minimal. Each plan will result in a minimal net addition to the present seven county area tonnage generated daily. Moreover, these increases will occur primarily during the summer months. The impact of TILP Phase III tonnage will be moderately negative when compared to present daily and yearly tonnage.

Table 18-18 DWGNRA Solid Waste Generation Impacts

	<u>WITHOUT TILP</u>		<u>WITH TILP</u>	
	<u>NPS</u>	<u>SDC</u>	<u>Phase I</u>	<u>Phase III</u>
Daily Visitors	18,600 <sup>1</sup>	40,000	45,065 <sup>2</sup>	138,195 <sup>3</sup>
Tons Generated Per Day By DWGNRA Visitors <sup>4</sup>	2.79	6.00	6.76	20.70
Tons Generated Per Day <sup>5</sup> Due to Induced Permanent Population Growth	4.56 <sup>6</sup>	12.16 <sup>6</sup>	15.21	103.79 <sup>6</sup>
Total Additional Daily Solid Waste Increases Due to DWGNRA (Visitors and Growth)	7.35	18.16	21.97	124.49
Percent Increase Over 1974 Level of 1901 Tons Per Day <sup>7</sup>	.38%	.96%	1.16%	6.55%

Notes:

1. Assumed proportional to SDC annual visitation.
2. Source: Table 18-1
3. Source: Table 18-2
4. Assumes .3 lbs./visitor/day. (See XXII.C.4(c)).
5. Assumed proportional to permanent population growth over 1974 level of 737,000 (Source: Table I-16) due to DWGNRA. Present solid waste generation is assumed to be 5.16 lbs./day/capita. (Source: XXII.C.4(c)). No additional second home development or solid waste generation is assumed directly due to DWGNRA (Source: XXII-112).
6. Permanent population growth is assumed proportional to total TILP Phase I growth (4,000,000 annual visitors) indicated in Table 22-38. Assumed waste generation is 5.16 lbs./capita/day.
7. 737,000 residents X 5.16 lbs./resident/day.

Criterion E.3 Minimize Air, Water and Noise Pollution

An influx of visitors (1.3 to 4 million) to a river-based park will not adversely affect the water quality presently existing. The NPS is responsible for constructing liquid waste treatment facilities as expressed in VI.D. Public Law 92-500 requires point source planning now being facilitated in on-going 208 studies (See VI.A. and XXI.) such as the Pennsylvania COWAMP Study. A minimum amount of roadways will be constructed and peripheral urban growth held to a minimum reducing the qualities of non-point urban run-off expected if TILP were implemented. Traffic loads produced by the expected number of visitors will not produce emmission affecting the regional air and noise standards. (See Chapter XXII).

Regarding air, water and noise quality for DWGNRA with TILP, Chapter IX presents an analysis of the effect of TILP upon the existing water quality. Impacts caused by construction are presented in Chapter X. The addition of TILP is not expected to affect the ambient air quality. However, the addition of motor-boating and higher concentrations of visitors will affect noise levels.

Environmental Comparison

A comparison of plans for DWGNRA with and without TILP highlights the following air, water and noise quality issues. The river-based park would not be subject to the water and noise pollution from power boats which a reservoir might experience if power boating were allowed. A river-based park would have somewhat less intensive use of the water as the recreational facilities would have more emphasis on land-based activities. This might put slightly less burden on the water ecology as fewer man-made beaches and boating facilities would need to be constructed. While this might put an equivalently increased burden on

land ecology, the 12,000 acres remaining of land would probably provide a more than adequate means of accommodating the extra use.

The impacts of air and noise resulting from transportation to and from the alternative DWGNRA plans is directly related to the level of patronage as auto usage is likely to be the primary mode under all plans for regional access. The lower patronage levels of the DWGNRA without TILP plans would result in lower auto usage and lower air and noise emissions as contributors to degradation of the existing air and noise quality in comparison with the higher levels of TILP Phase I and III. If paved roadways are required along TILP's lake shore, the problem of run-off (hydrological) from impervious surfaces (gas, oil, substances leached from the pavement) directly into the lake is increased. The removal of private cars from the lake shore, and the introduction of public transportation would greatly reduce noise disturbances.

The above discussion leads to the impact assessment that non-TILP DWGNRA's will have an overall minimally negative effect on pollution, while TILP plans will have an overall moderately negative impact on pollution.

Criterion F.1 Provide Needed Recreation Facilities

The table below indicates the relative percent of needed daily capacity satisfied by the various DWGNRA Plans with and without TILP.

Table 18-19 Percent of Total Peak Day Recreational Service Area Deficiencies Satisfied by DWGNRA<sup>2</sup>

	<u>Swimming</u>	<u>Boating</u>	<u>Picnicking</u>	<u>Camping</u>
Presently Needed <sup>1</sup> Activity Days in Recreation Service Area (000's)	9,192	422	2,619	859
NPS Plan	.4	4.7	2.7	4.1
SDC Plan	1.0	18.0	4.0	7.1
TILP Phase I Plan	3.1	13.0	5.6	3.8
TILP Phase III Plan	6.2	28.1	24.3	30.6

Notes:

1. See Table 4-39, page IV-141.
2. Percent calculations based on instant capacity multiplied by daily turnover rate. NPS Plan uses a swimming turnover of 2; SDC estimates are based on the consultants' recreation standards and turnover rates (see IV.B.3); TILP Phase I and TILP Phase III use Clarke and Rapuano recreation standards and turnover rates (see XVIII.E.4)

Table 18-19 indicates a range of DWGNRA facilities satisfying up to a substantial 30 percent of certain present recreation service area needs. If viewed in terms of swimming impacts, it can be seen that TILP Phase III will satisfy a maximum of 6.2 percent of current recreation service area needs. The significantly lower levels of the SDC and NPS Plans generate little to no impact; a minimally positive impact from TILP Phase I and a moderately positive impact from TILP Phase III. Boating, picnicking and camping follow roughly similar proportions for the alternative Plans.

Criterion F.2 Provide High Quality Recreation Experience

Intensity of visitation indicated in Table 18-10 is used as a key index of recreation quality in comparable parks within the recreation service area. Under the NPS Plan, the intensity of visitation is significantly less than that of similar parks including Harriman, Allamuchy, and Hopatcong State Parks. Accordingly, the quality of the DWGNRA recreation experience available under this Plan will be highly positive. Under the SDC and TILP Phase I Plans intensity of visitation falls within the range established by Harriman, Hopatcong, and Beltzville. Accordingly, the quality of the DWGNRA recreation experience under these Plans will be moderately positive. Under TILP Phase III Plan, the intensity of visitation will approximate that of Beltzville and Pyamatuning State Parks. Because the intensity of visitation at these parks is approximately triple that of Harriman, Allamuchy and Hopatcong State Parks, and DWGNRA developed under the SDC and TILP Phase I Plans, the quality of the recreation experience is likely to be significantly less. Swimming quality will be significantly affected by drawdown and eutrophication problems as well. Without major reshaping, drawdown (See XI.A.3, (a)) will create excessive horizontal distances from beaches to water's edge in late summer particularly at Phase III beaches including Tom Quick and The Cliffs. Eutrophication (See IX.A.6(e)(4)), will result in reduced water quality for both swimmers and boaters. The higher levels of eutrophication in the upstream and of the lake will have a greater effect on the swimmers at the additional TILP Phase III beaches noted above.

An additional consideration is the relative size of DWGNRA compared with parks used at equal intensity. DWGNRA, with 72,000 acres, is approximately three times as large as Pyamatuning State Park (25,833 acres) and 24 times as large as Beltzville State Park (3,007 acres). Thus, DWGNRA crowding extends itself over considerably greater areas, and hence, the net effect on the individual DWGNRA visitor is assumed to less positive.

These assessments by nature are subjective, but the above discussion leads to the impact rating that TILP Phase III will provide a lower quality or minimally positive recreation experience.

#### XVIII.E.4 TILP VERSUS NON-TILP RECREATION STANDARDS

The process of choosing appropriate standards is a critical substantive area of analysis. Too high or loose standards may cause overcrowding while too low or stringent standards may cause under-utilization for needed activities. Standards are the key to recreation planning. They determine the quality of the goods delivered to the consumer.

Standards, for purposes of analysis, may be either quantitative or qualitative. Quantitative standards reflect population and area capacities and are usually expressed as persons per facility, or facilities per acre. Qualitative standards are non-quantifiable by definition. They relate to the location, and juxtaposition of facilities. Values they address include natural systems impact and visual quality. In effect, qualitative standards represent imprecise descriptions of the evocative quality of outdoor recreation experiences.

For the purposes of programming recreation facilities both within DWGNRA and for the recreation alternatives to TILP/DWGNRA, a set of quantitative and qualitative standards are presented and analyzed in IV.B.3.

The discussion below relates primarily to design standards and criteria commonly used for recreation land planning of the four selected major activities described in the previous comparison of DWGNRA visitation mixes.

To begin, there are two basic problems to be dealt with inherent with any DWGNRA project, resulting from its goals and conflicting design determinants. First, it is the objective of the Clarke and Rapuano Plan to provide the maximum number of recreational opportunities while "preserving and enhancing" the natural environment. To achieve a degree of success in both of these objectives certain trade-offs in design criteria will be required, given the large number of visitors anticipated. Second, recreational, industrial, and municipal uses of water resources each have certain design requirements or demands which are, to an extent, mutually exclusive. Although combined use of one resource may afford certain overall economies and is hardly an uncommon practice, it is not the ideal solution from the standpoint of any one user. An example of conflict is the drawdown of a reservoir. In their standards for recreation areas the Corps notes the ideal condition is a fairly constant water level.

Swimming: This will be the largest use of DWGNRA in the Clarke and Rapuano Plan. Maximum planned capacity is for 49,600 people. It will also be most affected by drawdown. The ideal bank slope for reservoirs is steep in order to minimize the visual effects of drawdown, for a beach and swimming area, it is shallow. Topographic conditions at a reservoir's edge largely determine the most suitable for beach access to swimming. The Corps and Clarke and Rapuano anticipates extensive grading and importation of sand resulting in beach slopes ranging from 5% to 15%, perhaps steep in comparison to ocean beaches but the resultant of existing topographic restraints and the objective of minimizing the exposed drawdown areas discussed below. The projected water elevations are a normal pool of 410 feet; maximum flood 432 feet and average maximum drawdown to 390 feet.

Average difference in elevation to be anticipated during the normal swimming season is fully described in XI.A 3(a). Given a 10% slope on a typical beach, for the 20 ft. drawdown range, the horizontal difference in shore line would be approximately 200 feet (a 5% slope, 400 feet) likely to be revealing muddy shorelines in those instances where adequate sand fill is not provided. Considering the mean elevations of drawdown from Table 11-2 in which 50% of the instances of drawdown are greater and 50% are less, the 12 ft. vertical difference during the four month summer swimming season corresponds with a 120 ft. horizontal drawdown on a beach with a 10 percent slope and 240 ft. on a 5 percent slope.

With no lake, river beaches may require extensive grading also, possibly with protective jetties to reduce current, erosion and silting. The "swimming areas" within the river would appear more limited due to the river's width. Swimming piers may prove beneficial. The Save the Delaware Coalition proposal by Candeub & Fleissig, recommends more use of small ponds, dispersing the number of swimmers.

Swimming pools could be used to augment the possible capacity loss of natural beaches if the dam is not built, but these may not be a reasonable alternative due to their high development costs. In addition, New York State's Department of Parks and Recreation has determined the rather obvious conclusion that pools are less popular than beaches among campers.

Clarke & Rapuano use as a space standard of 50 square feet of beach per person, plus water area, parking and buffer area. This is the Corp's standard. In comparison: 25 square feet minimum is recommended for pool decks but not applied to beaches, the California Outdoor Recreation Plan recommends 100

square feet and Westchester County, 150 square feet. Parking, water area and buffer zones bring the total to 400 square feet per person. If the above higher standards are used, 4 to 6 miles of shore would be graded and defoliated for an equivalent swimming capacity or alternatively this capacity would be cut in half.

Boating: Most standards deal with the number of boats and parking spaces per launch ramp. The minimum of one ramp/40 launches and 25 spaces per ramp is the Corp's standard, and generally accepted. When projecting the amount of water area per boat there is wide disagreement. The Corps proposes one acre per boat, Soils Conservation Service call for 3 acres; Wisconsin 8; and Louisiana 20. Small fishing boats require only 1/4 to 1/2 acre; canoes, 1/4 to 1/2 mile of stream in Louisiana.

The Clarke & Rapuano Plan does not calculate the boating capacity of the project. The COE uses a standard of 4 people per boat which with 12,000 acres of water provides a capacity for over 40,000 people, which by itself almost equals the first phase total design load for all facilities. However, this standard is very high in comparison to others and is probably inappropriate for the type of boating anticipated on the lake.

Without a lake, only 1,000 to 1,500 acres of river remain. To avoid conflicts with swimming areas, Candeub & Fleissig in the Save the Delaware Coalition proposal recommend general boating in the lower 5 to 6 miles of river only. Using a minimum standard, there would be room for only 150 pleasure boats plus a few hundred small fishing boats. Navigation of the

length of the NRA would be interrupted by the beaches, and the total number of ramps could probably be minimized.

The Appalachian Mountain Club in its assessment of existing and desirable future canoeing capacities on the river estimate a desirable level of 1000 canoes/day or approximately 22 people/mile of river. This is based upon a launching capacity of 10-12 canoes/half hour/launch site. Given an average canoe trip of 7-11 miles and 2-7 canoes per group, there would be no real increase above present usage if this standard were maintained. The present NPS plan, for DWNGRA without TILP indicative of the low end of the visitation range, is in accord with this standard.

Water skiing would be eliminated by space requirements (3-5 acres per boat) if the dam is not built. Boating would have to be oriented toward canoes, and rowboats and one segment of recreation opportunities minimized but environmental quality would be raised, i.e. boat ramps and docks would be minimal, pollution from outboard engines eliminated, and aquatic life and water fowl would not be disturbed by waves and noise from fast moving craft.

Camping: Campgrounds are generally limited to relatively flat or gently sloping areas. Clarke & Rapuano find adequate upland space for its programmed number of camp sites. Obviously, lakebed areas would be used for such activities if not flooded.

Space standards range from 2 to 4 sites per acre (Forest Service, Bureau of Land Management) to 14 sites/acre (Louisiana). Five sites per acre is recommended by the Corp's, while the Clarke & Rapuano Plan seems to show 8 to 10 which

represents a medium to higher density condition. By concentrating this activity, Clarke and Rapuano leave additional upland acreage undisturbed. The Appalachian Mountain Club, in its analysis of DWGNRA, has categorized three types of trails and campsites and appropriate densities for the latter dependant on location and adequate natural conditions: formal campgrounds adjacent to activity centers (most dense), country-side (50 sites/location), back country trail (10 sites/location), and solitude (1 site/location). For formal campgrounds, NPS finds that 150-200 sites/location are more efficient to administer than 50-100 sites/location.

Clarke & Rapuano recommend the exclusion of vehicular campers and trailers, following NPS administrative policy, although density levels for this type of campground are usually higher than tent campgrounds. Adjacent swimming and boating facilities as being favored by campers according to a recent N.Y.S. Parks & Recreation Survey. However, most camp sites are not located adjacent to the lake in the Clarke & Rapuano Plan.

Picnicking: Standards range from 4 to 12 tables (or sites) per acre with 15 being Corp's preferred standard. Areas designated on the Clarke & Rapuano site Plan appear close to 8. The relatively high densities may be acceptable near beaches and where picnicking is a secondary activity. The effect of no lake on picnicking as an isolated activity would allow use of the existing large flat open areas of the bottom land. Impoundment would move the picnic areas to the higher and steeper forested areas of DWGNRA, possibly eliminating space which could be used for sports adjacent to the picnic sites.

Design Standards: Most space standards used by Clarke & Rapuano appear based on medium to high density, the objective being to concentrate people in several

areas and leave large undisturbed spaces between. Facilities for boating, swimming, camping and picnicking are generally clustered near service areas and access routes. Smaller walk-in camp sites are provided away from the lake for those who enjoy more seclusion. The proposed access scheme reinforces this by placing north-south vehicular routes outside DWGNRA.

#### XVIII.E.5 EFFECTS OF DRAWDOWN AND EUTROPHICATION ON THE QUALITY OF RECREATION EXPERIENCE

The quality of the DWGNRA experience will be determined in large part by the character of the Delaware River or Tocks Island Lake. The visual character of water areas will be largely established by bank conditions and the color and purity of the water.

Bank conditions are affected by drawdown and water quality by eutrophication. The following discussion concentrates on TILP effects because while the free flowing river experiences variations in level and water quality, it is self-regulating to a large extent. The scenic qualities of the Delaware River in their present natural condition, bring delight to the majority of present DWGNRA visitors. The image of the free flowing river in a visually coherent river valley provides DWGNRA visitors with a sense of the inherent order and beauty of undisturbed natural systems.

##### XVIII E.5(a) Drawdown:

TILP will effect significant changes in DWGNRA's visual character. Gently sloping fertile bottomlands would be replaced with the horizontal plane of the lake's surface. The lakeshore, periodically exposed by seasonal drawdown patterns, will constitute a strong visual element within the DWGNRA landscape. During several months of the year areas, between the lake edge and forested valley walls will appear mostly barren, and unnatural. Steep bank areas may be mostly rocky. Gently sloping banks will be largely mudflats comprised of alluvial soils. The late summer sun will bake such drawdown zones, leaving a parched foreground for fall foliage

viewers. While the above example represents conditions of extreme drawdown, exposed banks can be expected to intrude into the Tocks Island landscape during some portions of the year. Such areas will serve to remind DWGNRA visitors of the lake's man-made utilitarian purposes and symbolize interference with natural systems. A full discussion appears in XI.A.3(a).

#### XVIII.E.5(b) Eutrophication

Water quality forms the other half of the TILP recreation quality of experience. The suitability of TILP as a landscape element and for swimming and boating is best described in IX.A.6(e)(4) Recreation Impacts, here quoted at length: from page IX-83:

"...some swimmers and boaters will find the conditions of the upper lake uninviting. The water will probably be turbid, the beaches may be covered with periphyton algae and the shallow areas may be colonized with rooted microphytes. Other swimmers and boaters may find the conditions acceptable because few other choices are available. From a recreational viewpoint, fishermen may find the lake outstanding because the warm water sport fishery should be excellent. Speedboat enthusiasts will more than likely gravitate to the middle and lower stretches of the impoundment. Canoeists and small boat fishermen will occupy the upstream reaches. Swimmers may find the periphyton algae growing on the beaches to be a minor nuisance, but we believe that the condition will be no different from the conditions experienced by swimmers at any lake in the three-state area."

Based on the above findings, at certain times of year, TILP water quality is unlikely to compensate for the unpleasant image of drawdown banks adjacent to swimming and boating areas especially in upper reaches of the lake at the end of the summer season.

Thus, both drawdown and eutrophication will at times spoil the romantic image of a huge clear upland lake nestled among gently rolling hills. Instead, the spectre for some of the year becomes a less inviting lake with sections of barren bank areas which horizontally scar the landscape.

Finally, the effects of eutrophication and drawdown on the recreation patronage of DWGNRA with TILP should be measured against the relative levels of recreation demand and supply within the recreation service area. As the existing and future unsatisfied demand for swimming and boating exceed the capacity of this proposed facility many times over, this potential reduction in the quality of experience at DWGNRA with TILP would not significantly reduce demand and thus the margin between supply and demand. Hence, the patronage or usage of TILP's water based facilities would not be reduced, as those potential users who stay away because of these consequences of reservoir operations are likely to be replaced by others unaffected by these conditions.

## XVIII.F. PATRONAGE AT DWGNRA WITH AND WITHOUT TILP

The patronage achieved at DWGNRA with or without the lake will be as much a factor of administrative and design decisions as the presence or absence of the lake per se. The comparisons in this chapter build upon the demand forecasts presented in Chapter IV and the visitation comparisons already presented in Chapter XIII. Within this framework, there are four major determinants of the actual patronage for alternative concepts of DWGNRA: market demand, facilities provided, rationing techniques and programmed activities.

### XVIII.F.1. MARKET DEMAND

It was demonstrated in Chapter IV that the recreation demand in the service area is so great that even when used to capacity, any of the alternative schemes for DWGNRA would serve only a small portion of the service area demand. This is true even when the demand is adjusted for a "travel time decay" factor which indicates the willingness of residents of the service area to travel to the DWGNRA site. Table 18-20 below summarizes the total activity days demand for seven major recreation categories of recreation activity under the medium economic growth level. These figures are taken from Appendix Table 4.A.10(a)and(b) to Chapter IV where the corresponding figures for the high and low growth options and other forecast years can be found.

Table 18-20 Travel Time Factored Demand for Recreation Activity in DWGNRA, Moderate Growth Level

	Thousands of Activity Days				
	1974	1985	2025	Increase 1974-1985	Increase 1985-2025
Swimming	94,642	109,856	154,730	15,214	44,874
Picnicking	28,878	31,621	38,968	2,743	7,347
Boating	28,771	34,642	52,106	5,871	17,464
Fishing	21,477	23,422	30,125	1,945	6,703
Hunting	8,490	9,264	11,938	774	2,674
Hiking	31,220	33,946	43,358	2,726	9,412
Camping	30,994	33,462	42,377	2,468	8,915

Source: Appendix Table 4.A.10, Chapter IV.

The table also shows the increase in demand with potential for being satisfied by recreation development at the DWGNRA location. These figures are also greatly in excess of what can be provided at the location under any of the alternative schemes.

Table 18-21 shows the geographic distribution of this time-factored demand for key water-based and land-based recreation activities. It should be noted that this does not necessarily represent the distribution of the actual patronage for all alternative DWGNRA's, a point which is developed further in the discussion of Table 18-22. The intent of this table is to indicate the relative distribution of demand among major geographic sub-areas and to point out the relatively minor differences between the patterns of water- and land-based recreation demand.

**Table 18-21 Geographic Distribution of Demand for Selected Recreation Activity in DWGNRA, 1985, Moderate Growth Level**

	Swimming		Boating		Camping		Hiking	
	Demand	Percent	Demand	Percent	Demand	Percent	Demand	Percent
Seven-County Impact Area	7,215	6.6%	2,107	6.1%	1,957	5.8%	2,799	8.3%
New York SMSA	37,256	33.9	11,708	33.8	10,697	32.0	11,042	32.5
Philadelphia SMSA	13,049	11.9	3,786	10.9	3,980	11.9	3,617	10.7
Newark-Jersey City SMSA	6,436	5.9	2,225	6.4	1,961	5.9	2,049	6.0
All Other	45,900	41.7	14,816	42.8	14,867	44.4	14,439	42.5
Total Service Area	109,856	100.0%	34,642	100.0%	33,462	100.0%	33,946	100.0%

Note: Demand is in thousands of activity days,  
factored for distance to DWGNRA from each  
county in the Recreation Service Area.

If each alternative DWGNRA were to service all portions of its effective market equally (that is, the same "penetration" of the market in each county) then the visitation could be proportional to the geographic distribution of the market. But it is unlikely that residents of all portions of the service area would have the same propensity to visit DWGNRA even though the distance factor has been considered in the demand analysis. For example, residents of the seven-county impact area would tend to use the swimming and boating facilities of a DWGNRA with a lake more frequently (on a per capita per year basis) since it would serve as a nearby facility for short trips and outings while residents of more remote portions of the recreation service area would consider it a major excursion and would visit TILP less frequently choosing just as often the well known alternatives both in and outside of the recreation service area. Consequently, the first column of Table 18-22 represents the consultants' forecast of visitation to DWGNRA with TILP derived from the geographic demand figures but indicating an increased (approximately 2.5 times) penetration of the seven-county impact area demand, a moderately increased penetration of the market in the surrounding ring of counties and a lower than average (since the total must equal 100 percent) penetration of the remaining counties. A more detailed geographic presentation of this forecast is given in Table 22-30 in Part E.

Table 18-22 Geographic Distribution of Patronage  
for DWGNRA With and Without a Lake, 1985

	<u>DWGNRA With TILP</u>	<u>DWGNRA Without TILP</u>
Seven-County Impact Area	17.7%	6.8%
New York SMSA	25.7	33.0
Philadelphia SMSA	9.0	11.4
Newark-Jersey City SMSA	4.6	6.1
All Other	<u>43.0</u>	<u>42.7</u>
.. Total Service Area	100.0%	100.0%

If DWGNRA is developed with more unique recreation attractions such as historic, archeological and environmental interpretation and education, a more even penetration of the market can be expected because of the lack of comparable experiences and the less frequent "repeat" business from residents in the impact area. The second column in Table 18-22 then shows the source of visitation being proportional to the time-factored demand. Because the exact distribution here will depend upon the mix of facilities and the nature of the attractions, the percentages in Table 18-22 might best be thought of as expressing a range of possibilities -- a range which is addressed in the analyses of Chapters XXII and XXV.

#### XVIII.F.2. FACILITIES PROVIDED

With this demand framework it has been concluded that the facilities provided, by their nature and their capacities, will be the primary influence on the actual patronage. Factors developed in Chapters IV and XIII have been used to make estimates of visitation based upon the design capacities. Again, it should be noted that design criteria must be carefully considered as to whether they are effective capacity limits or only desired utilization rates which could easily be exceeded at the expense of the quality of the experience -- assuming sufficient market demand and no artificial constraints or rationing techniques. If the visitation level is to be controlled, it is possible to design the types of activities which are less in demand or even design more primitive facilities and thereby influence the patronage level. For example, a recreation facility could be designed with the right mix and quality of facilities to attract a given number (say 4,000,000) of visitors rather than design a facility which would attract, say, 10,000,000 visitors and then artificially constrain the attendance.

Given the facilities components developed earlier in this chapter and the annual-to-instant capacity relationships established in Chapter XIII, the projected visitation for each of the four principal alternative DWGNRA's is summarized below.

Table 18-23 Visitation Estimates for Alternative Recreation Configurations at DWGNRA

National Park Service	1,652,000
Save the Delaware Coalition <sup>1/</sup>	3,863,000
TILP - Phase I <sup>2/</sup>	4,000,000
TILP - Phase III <sup>2/</sup>	10,600,000

1/ As developed in Chapter XIII, Table 13-6.

2/ Using Clarke & Rapuano's formulae; using formulae developed in Chapter XIII would give 4,462,580 in Phase I and 12,306,930 in Phase III.

One interesting aspect of these visitation estimates is the percent of pass-through sightseers included. As discussed in Chapter IV, 20 percent of the total visitation has been projected to be sightseers in the Clark & Rapuano and previous plans. But as the active participation decreases, an increased percentage of sightseers might be expected since the land area and "sights" remain essentially the same in each case. Therefore the sightseers in the NPS plan constitute almost 30 percent compared to 20 percent in the TILP - Phase III. On the other hand, as explained in Chapter XIII, the SDC plan will have an even smaller pass-through component (about 16 percent) because of the diverse attractions to entice the casual visitor to stop, even if he doesn't have his bathing suit or picnic basket along.

With regard to the Save the Delaware Coalition plan, it should be noted that this visitation estimate is consistent with the assumptions outlined in Chapter XIII for this proposal and is not necessarily the optimum or likely level of development under that plan.

For purposes of evaluating alternative recreation components of the three programs in Chapter XVI, it was assumed that DWGNRA without TILP would be in operation in all instances at an annual visitation of 4,000,000, approximating the SDC Plan.

#### XVIII.F.3. RATIONING TECHNIQUES

Visitation to the recreation area and, more importantly, the impact on the community will also be influenced by the techniques and controls used to constrain attendance on those peak days where visitation exceeds the desired or physical capacity of whatever facilities are provided. For example, merely to lock the gates at ten in the morning without an effective pre-warning system has a potential for creating greater impact on the surrounding communities than a system of, for example, advance reservations for boat launchings. Although, it should be noted that the public will get use to and adjust to peak periods as was noted in the case of Beltzville State Park in Chapter IV. While charging for admission, parking or use of specific facilities is common in the recreation service area, as described in the appendix to Chapter XIII, such charges are usually nominal and do not reflect the true market rate. To increase charges to the point they are an effective rationing technique would violate the basic concept of public recreation.

#### XVIII.F.4. PROGRAMMED ACTIVITIES

The composition of facilities provided, the location of DWGNRA and the natural attributes of the area will dictate a certain "natural" distribution of visitation as to weekend versus weekdays, summer versus winter and the like. Therefore, facility design may control the peak day attendance but the total visitation over the year is considerably more volatile. Promotion and administration of the facility can do much to increase weekday

and winter use and increase annual visitation within a fixed set of facilities. Many of the community impacts, particularly those relating to physical facilities must be geared to peak, not annual, visitations and therefore the increment of programmed visitation can be accommodated with a full "benefit" with perhaps a much lower marginal cost.

The visitation forecasts developed here and in previous chapters and used in the impact analyses represent such a "natural" distribution. But given the nature of the alternatives, it is reasonable to assume that the additional increment that could be achieved by, for example, an intensive program of busing school children to the site for educational and recreation purposes, would be greater under the National Park Service or SDC plans where the historical and archeological educational opportunities would be preserved to a greater extent.

### XVIII.G. BENEFITS AND COSTS

The most important institutional aspect to the alternatives with regard to benefits and costs is that without the lake and involvement of the Corps of Engineers, DWGNRA would be freed from any statutory requirements for demonstrating a particular benefit/cost ratio. But even if it were not, the "official" benefit/cost analysis does not make explicit consideration of secondary benefits and costs which in the recreation category are primarily measured in terms of the responses of the local community to the impacts of the visitors -- that is the increase in retail sales, employment and land values compared to the costs of constructing new facilities and providing services. The analysis is also complicated by the fact that some secondary impacts, those caused by the acquisition of land for the project and the dislocation of people and business, have already occurred and will be unaffected by whether there is a lake or not on this site in the future. Other indirect impacts will be influenced largely by the level of patronage at the facility and these impacts are described fully in Chapter XVI, in previous sections of this chapter and in the entire Part E. The remaining comments in this section address the direct costs of alternative DWGNRA's.

The most significant component of costs, and one which is common to the non-TILP options, is the acquisition of land. As described in Chapter XIII, this is estimated at \$134,410,000 for the entire 69,690 acres. While it is true that the non-TILP alternatives could make use of life tenancies, easements, leases or leasebacks to reduce total land costs, these mechanisms

would not be without their own costs and over \$90,000,000 has already been spent on land acquisition. Therefore, the possible net savings of other techniques would be small compared with the overall total and are not quantitatively expressed in this analysis. As to the option of acquiring no further land, Chapter XIX dealing with the effects of deauthorization concludes that this would leave an unworkable recreation area.

For the lake-based options, the land cost explicitly included in the recreation costs are \$75,682,000, the consultants' estimate of the total acquisition cost for the additional lands needed to create DWGNRA over and above that which would be necessary for the lake's other purposes.

Total capital costs for recreation facilities were developed in Chapter XIII for the Save the Delaware Coalition plan. Using similar unit costs for various recreation facilities, the capital cost (including a 25 percent contingency factor) for each of the alternative DWGNRA's is summarized below.

Table 18-24 First Costs of Alternative  
Recreation Configurations at DWGNRA

	<u>Land</u>	<u>Capital</u>	<u>1/ Relocation of Highway 209</u>	<u>Total First Costs</u>
National Park Service	\$134,410	\$ 12,225	\$15,000	\$161,635
Save the Delaware Coalition	134,410	24,958	15,000	174,368
TILP - Phase I	75,682	107,218	3,900	186,800
TILP - Phase III	75,682	194,913	3,900	274,495

Note: Thousands of dollars.

1/ From unit cost in Chapter XIII and TILP costs in Chapter XVI

The final component of capital cost is some portion of the required relocation of Route 209 in Pennsylvania which would be required for proper functioning of any recreation area. This is estimated to be \$15,000,000 out of a total relocation cost of \$31,550,000 for the non-TILP options. For TILP, this \$15,000,000 would be shared with the other authorized purposes, and only \$3,900,000 is allocated to recreation (in Chapter XVI.). The capital costs for the TILP options also include the share of the land costs for the reservoir portion of the site allocated to the recreation purpose. This cost cannot be separated out of the total capital costs shown in Chapter XVI.

While there may be differing qualities of the recreation experience under the various options, it is difficult to arbitrarily assign different dollar benefits to visitation under the alternatives. The problems inherent in recreation benefit estimates have been discussed elsewhere in this study.

But any dollar estimate of benefits is only useful in the mechanical step of calculating a benefit/cost ratio; it is far more informative and useful to the reader to present the costs of these alternative DWGNRA's in terms of cost per visitor. The reader can then judge for himself whether the concepts of recreation described in this chapter are consistent with the differences in cost.

To make this evaluation, Table 18-25 below summarizes the total first costs (annualized at 5-7/8 percent), annual operating and maintenance costs, projected visitation and the resultant cost per visiotr.

Table 18-25 Annualized Costs Per Visitor of Alternative Recreation Configurations at DWGNRA

	<u>Annualized First Costs</u> <sup>1/</sup>	<u>Annual O&amp;M</u>	<u>2/ Visitors</u>	<u>Cost Per Visitor</u>
National Park Service	\$10,076	\$ 589	1,652	\$6.45
Save the Delaware Coalition	10,870	1,377	3,863	3.17
TILP - Phase I	11,645	1.191	4,000	3.21
TILP - Phase III	17,112	4,086	10,600	2.00

Note: First costs and operations and maintenance in thousands of dollars.

1/ At a 5-7/8 percent amortization rate; a factor of .06234.

2/ From unit cost factors presented in Chapter XIII.

As with the benefit/cost analysis of the TILP project itself, the consultant team does not mean to imply a great importance to benefit/cost analysis by its quantification and inclusion here. Major limitations to such an analysis have been identified elsewhere in the report -- most noteably the inability to quantify all relevant variables including environmental, local and regional economic, institutional, lifestyle and other impacts which have been fully discussed. This discussion of costs then is not meant to be a summary evaluation but rather only one component to be read in conjunction with this entire chapter comparing other aspects of alternative recreation configurations at DWGNRA.

## XVIII.H. SUMMARY

From the recreation component of this comprehensive study (Chapters IV, XIII, and XVIII) certain findings and conclusions relative to DWGNRA are here summarized.

For many, the true legacy of DWGNRA is the undisturbed land it will preserve for future generations. Given this legacy and the difficulty of exact predictions of recreation demand, flexibility in the DWGNRA plan is highly desirable. It is apparent that a plan incorporating a free-flowing river best preserves the natural setting, historic structures, and archeological sites and natural recreation potential of the area. The flora and fauna of this relatively beautiful valley are undisturbed. The historic sites, while of limited value as a significant segment of our nation's history, are genuine and represent an increment of our heritage. Regarding recreation facilities, it should be noted that what is not provided by the adopted plan for DWGNRA can be provided at some unspecified future date assuming a flexible initial plan.

The key recreation facility issues appear to be the following:

- the amount of land-based versus water-based recreation activity summarized in Tables 18-8 and 18-9.
- the day visitor versus the overnight visitor and accommodations for both within and outside of DWGNRA. The present NPS Plan for DWGNRA without TILP contemplates park facilities for nearly 5,000 overnight visitors for an

estimated 18,400 instant capacity and 1,185,000 annual visitation, while DWGNRA with TILP (Phase I: 40,585 instant capacity and 4,000,000 annual visitation) provides overnight facilities for only 2,820 (see Table 18-1).

- the "holding capacity" of the natural systems of the area. Suitability ratings have been developed for the entire 72,000 acre land area on a 2-1/2 acre cell basis for each of the basic activities: intensive recreation development, family and primitive camping, hiking, biking, and horseback riding. From the basic natural systems evaluation criteria of slope, soil depths, drainage, etc., only a small portion of the land is suited for intensive development and most of the land is not well suited for any development. However, an overall "holding capacity" cannot be calculated from this information as there are far too many uncertainties and subjective judgments. It is obvious that the "holding capacity" depends on the level of development and access provided and not merely the natural characteristics of the setting. Its determination is a cyclical procedure of facility proposals and impact assessments. Thus, it is NPS policy to provide only those facilities for which it is known that local environmental degradation will be minimal. The park's total "holding capacity" then becomes the summation of the individual facility capacities.
- the types of visitors attracted by a preponderance of water-based versus land-based recreation activities. The former will attract a more even distribution of visitors, more directly in proportion to the population and demand patterns of the service area, given the relative uniqueness of DWGNRA facilities being stressed under this option. A lake based area would provide a more

common recreation experience found elsewhere in the service area and hence a higher level of particularly "repeat" patronage will be from those visitors most familiar with the area who reside in the immediate seven county region. In this case, more distant visitors would be more likely to weigh the advantages of closer areas offering similar facilities rather than make the major trip. A full discussion of patronage is found in XVIII.F. with a geographic distribution illustrated in Tables 18-21 and 18-22.

- the opportunities for mass transit to and within DWGNRA. The potential for bus transit within DWGNRA, to the extent needed, appears to be favored under the non-TILP alternatives as the lake virtually eliminates the possibility of north-south vehicular connections within DWGNRA. A discussion of external mass transit connections and potentials for DWGNRA with TILP is found in XXV.
- the quality of experience of a lake versus river based park. A long hard view of DWGNRA relative to other available recreation in the northeast United States is in order. These other existing facilities are thoroughly documented and analyzed in Chapter IV. Potential alternatives to DWGNRA with TILP are proposed and evaluated in Chapter XIII. Without doubt, the area's visual and natural qualities represent significant resources, and DWGNRA will offer enjoyment to many regardless of which plan is developed. However, the effects of DWGNRA with TILP's reservoir operation and water quality, discussed in XVIII.E.5 pose some significant reservations concerning its pastoral or natural recreation value. The effect of drawdown would be a new and no doubt defacing visual element in this portion of the Delaware River Valley. In terms of the experiential quality of only those recreation

activities dictated by the lake or river, the difference lies in one's personal assessment of canoeing versus motor boating and river versus lake swimming. Preferences exist, of course, on both sides of these choices. Most other proposed and existing recreation activities are feasible under all alternative plans.

In terms of recreation supply, the major difference between the alternative DWGNRA Plans is, of course, the presence or absence of the lake. An additional 9,632 water acres is provided by TILP (a 12,000 acre lake) over the existing river (2,368 acres). Considering the likely water quality improvement of both the Delaware and Hudson Rivers (approximately 8,960 and 68,480 water acres, respectively, within the recreation service area), with the implementation of PL 92-500 by 1985, TILP represents 12.4 percent of the combined net recreation water area increase within the service area. DWGNRA and TILP under all configurations, represent a very small increase in the recreation service area's supply of various facilities. Recent trends in recreation planning are toward locating facilities within easy automobile and mass transit access of population centers (see Chapter XIII.F.3 and F.5 recreation alternatives). Given this and the rising cost of travel due to gasoline prices, an intensely developed DWGNRA would appear anachronistic.

The major environmental, social, institutional, economic and land use impacts of DWGNRA can be summarized as follows. The majority of the direct impacts from DWGNRA with and without TILP are due to the quantity of recreation visitors and induced permanent population into the seven county area. Indirect recreation benefits accrue to the residents of all the service areas, with a greater proportion of the benefits going to those within closer distances of DWGNRA/TILP,

except for the seven county residents who must "pay" according to the impact matrix in Table 18-9. Generally, these impacts become more distinct and pronounced, whether more positive or negative, with those plans that accommodate higher visitation levels. Without DWGNRA, there would likely be little impact on the seven county area except for its significant normal growth projections. From this table, the critical impacts can be defined under the major headings of administrative, economic, natural systems and physical design components. The most critical administrative concern is the ability of local governmental units to institute adequate controls to properly channel the induced urbanization. The most critical economic impacts are the effects on local employment and property values. Flora and fauna disturbance is the most significant natural systems impact. Proper physical design of and by itself is the greatest asset to achieving a high quality of recreational experience. Design can properly channel the park's wide variety of visitor-types into the kinds of experience at the proper density which each type seeks and from which it will benefit. It is the facilities provided in parks which attract visitors. It has been the experience of NPS and others that some self-regulating mechanism, not fully understood, tends to keep use within the capacity of all facilities available, when properly designed and located. Occasionally, more people want to use a given facility than the facility can accommodate but seldom do more people try to use a park than the park can accommodate.

If one were to aggregate roughly the impacts of the nineteen criteria presented in Table 18-9, the non-TILP plans are clearly more likely to result in net benefits to the region than the TILP plans. Impacts are generally proportional to the level of visitation. From the list of nineteen criteria, five criteria

do not result in significantly differentiating assessments in that three of the four alternative plans evaluated produce consistent impact levels (A.3; C.3; D.2; D.3; E.2). All other criteria represent an impact range of at least three ranks with open space preservation (A.1), high quality of recreation experience (F.2), and particularly historical and archaeological site preservation (B.2) indicating the broadest impact differences among the four plans. These are followed by flora and fauna disturbance (E.1) and retail and service expenditures (C.2). It appears, therefore, that DWGNRA with TILP is inferior from a natural system standpoint to the free-flowing river and its impacts on the man-made fabric of the area represent a greater overall negative change on the region's present character.

CHARTER XXX

PROJECT DEAUTOMATION

## XIX.A. DEAUTHORIZATION ISSUES

### XIX.A.1 INTRODUCTION

Section 203 of the Flood Control Act of 1962 (PL 87-874) authorized the Army Corps of Engineers to construct the Tocks Island Dam and Reservoir as part of eight other major flood control projects in the Delaware River Basin. In 1965 Congress further authorized the Delaware River Gap National Recreation Area (PL 89-158) to be developed in conjunction with the Tocks Island Reservoir, by the Department of the Interior. This Act also authorized the acquisition of some 47,000 additional acres of land surrounding the Reservoir for recreational purposes. Then in 1970 the original authorization for the Tocks Island Dam was further expanded under PL 91-282, to permit the construction of the Kittatinny Mountain pump storage facilities by private utility companies under specified environmental controls. These three authorizations, each administered by a separate federal agency, make up the basic components of the Tocks Island Lake Project, and form the framework for this analysis of the institutional steps involved in deauthorization and the resultant impacts.

The current status of each of the above project components is as follows:

#### DWGNRA

As of April 30, 1975, \$48,395,255 has been spent on land acquisition for DWGNRA, and 31,043 acres or 69.4 percent of the total acreage has been acquired. During the past three years the Park Service has not received any additional appropriations for land acquisition. The balance of the 13,357 acres to be acquired

are primarily located in the Worthington tract, along Route 209 at the western boundary, and internal parcels within the current acquisition area.

As discussed in Chapter XVIII the latest plan for the recreation service area based on a lake facility is the 1974 Clarke and Rapuano Plan, jointly sponsored by NPS and the Corps. Currently, the Park Service is undertaking preliminary in-house planning studies for a recreation area without a lake.

Thus far, the Park Service has spent \$2,408,000 for development of roads, trails, buildings and utilities, and approximately \$4,000,000 for operating costs. The development of additional facilities has been limited by the patchwork quality of the current land holdings, the uncertain status of TILP, and the requirement for an environmental impact statement based on a final selected plan. Although the park has not yet "officially" opened to the public there was an estimated annual visitation to the recreation area of 900,000 persons in 1974.

TILP

The Corps began feasibility and design studies for the Tocks Island Dam in 1956 and began acquiring land for the project in 1966. The engineering and EIS statements have been completed and the project has been ready for construction since 1971. As of April 30, 1975, the Corps has spent \$48,698,600 on land acquisition, and has acquired 16,826 acres or 66 percent of the total required project acreage. The remaining 8,464 acres for acquisition are primarily located in the area from Milford to Port Jervis and in isolated tracts throughout the land area required for the lake. For both the DWGNRA and TILP lands, the Corps has acted as purchasing agent. Those lands acquired for the

National Park Service are turned over to the Park Service for maintenance as soon as they are purchased. Of the lands acquired for TILP, a portion are leased back on one year leases (for residential, commercial and agricultural uses) and the balance have been turned over to NPS for interim maintenance pending appropriations for construction of the dam and reservoir.

In addition to land costs, the Corps has spent \$10,062,700 for clearing, engineering and design, administration, and maintenance for TILP. This figure also includes reimbursement from Penn-DOT for the Route 209 relocation design and engineering.

#### Kittatinny Pump Storage Facilities

Feasibility studies for the development of pump storage electric peak power generation facilities using the Kittatinny Mountain Ridge on the New Jersey side of the Delaware River, were initiated by a consortium of three private utility companies in the early 1950's. These feasibility studies by the Public Service Electric and Gas Company, the New Jersey Power and Light Company, and the Jersey Central Power and Light Company, involved a staged development plan with two main components. One, an initial stage development of the Yards Creek 330 MW pump storage facility on the east side of the Kittatinny Ridge, and two, the Kittatinny pump storage facility on the west side of the ridge which is planned to generate approximately 1300 MW. In 1960, the utility companies acquired 715 acres of land for the development of these facilities, and in 1961 submitted the package to DRBC for approval. In 1962, DRBC approved the initial phase or the Yards Creek facility, and withheld approval of the Kittatinny facility pending further investigation of the integration of pump storage facilities into the Tocks Island Lake Project by the Corps. After obtaining

approval from the Federal Power Commission in 1963, the Yards Creek facility was constructed and became operational in 1965.

With the authorization of the Tocks Island Lake Project in 1962, and subsequent studies by the Corps confirming the feasibility of developing pump storage facilities in conjunction with the Project as authorized, the utility companies submitted amended applications to DRBC in 1963 and again in 1965 revised to conform to Corps plans. These applications raised a series of environmental issues and lead to the passage by DRBC of Resolution 68-12 prohibiting the use of Sunfish Pond as the upper storage reservoir.

Then, in 1970, Congress enacted PL 91-282 which established the basic requirements and environmental standards for the private development of the Kittatinny pump storage facility and conventional hydroelectric power generation as part of the Tocks Island Lake Project. This law included the provisions of DRBC Resolution 68-12, and reserved the right of the federal government to develop the hydroelectric power facilities if it so desired. Based on PL 91-282, the utility companies submitted an amended application in 1971 for DRBC approval to develop both the Kittatinny pump storage and the conventional hydroelectric power facilities. To date, no action has been taken by DRBC on this revised application, pending a congressional decision on whether to appropriate funds for the construction of the Tocks Island Lake Project itself. As of June, 1974, more than 1.5 million dollars have been invested by the utility companies in land acquisition and planning studies for both the Yards Creek and Kittatinny pump storage facilities.

The above outline of the current status of each of the project components sets the stage for the deauthorization analysis of this chapter. The question being asked is not whether any or all of the authorized projects should be deauthorized, but what if one or more were deauthorized, and what would be the effects of that action. This question is broken down for analysis into three general sections: one, the legal and institutional procedures and considerations involved in deauthorization; two, a general evaluation of a range of deauthorization options; and three, the implications of deauthorizing the Tocks Island Dam and Reservoir. Alternatives to the four functional purposes of the project (water supply, electric power, recreation, and flood control) which could be developed in the event of deauthorization of any of its components are evaluated in Part C Chapters XII through XVI.

## XIX.B. LEGAL ANALYSIS OF DEAUTHORIZATION

### XIX.B.1 LEGAL AND INSTITUTIONAL STEPS TO ACCOMPLISH DEAUTHORIZATION

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Stated simply, with the exception of the procedure specified in the Water Resources Act of 1974, there is only one way to deauthorize the Tocks Island Project, or any other authorized public works project, and that is for the Congress to pass an act explicitly deauthorizing the Project. Failure to appropriate construction funds will not lead to automatic or "implied" deauthorization. Under the Water Resources Act of 1974, when any Corps of Engineers project has been authorized for at least eight years, without any Congressional appropriations within the last eight years, a process is

triggered whereby the Chief of Engineers is obliged to review such projects and submit a list of which ones should no longer be authorized (S12 (a) of PL 93-251; 88 Stat. 12, March, 1974). Unless either the House or Senate Public Works Committee adopts a resolution within 180 days that a project on the list shall continue to be authorized, the listed projects are thereupon deauthorized. The Secretary of the Army may also remove a project from the "deauthorizing list" while the 180 day period is running. However, this procedure may not be invoked for the Tocks Island Lake Project until the early 1980's.

Project deauthorization creates three significant complications. First, is the problem of what happens to the lands which have been acquired for use directly as a part of the Project. Second, is the question of what effect, if any, deauthorization would have on the Delaware Water Gap National Recreation Area (DWGNRA) established by PL 89-158 in 1965 (16 U.S.C. SS460o to 460o-7) and the pump storage facilities as permitted under PL 91-282. The third involves the legal implications of the "Walpack Bend" agreement between the States of New Jersey and Pennsylvania if the Project were deauthorized.

#### XIX.B.2 DISPOSAL OF TILP LANDS

With respect to the effect of deauthorization on already acquired Project lands, it must be assumed that the Congress will take account, in any deauthorization legislation, of the need to explicitly address the question of use or disposition of the acquired Project lands. If it does address the issue, Congress may direct virtually any disposition or use of the lands which it desires. (United States Constitution, Article IV, Section 3, Clause .2). Although highly unlikely,

the Congress could also return the lands to private ownership, but if it did, it would not be bound to provide for re-acquisition by former owners.

If Congress did not articulate specific new federal, state or local governmental uses for the property acquired for the Project, or otherwise mandate its disposition, the Project lands would become subject to the provisions of the Surplus Property Act, as amended (40 U.S.C. S471, et seq.), and the detailed regulations providing for disposition of excess and surplus real property of the United States, which have been promulgated pursuant to the Act (41 C.F.R. S101-47). The consultants are reluctant to assume however, that the United States Congress would leave the question of disposition of substantial holdings of acquired lands, which have been involved in a controversy as significant as the one at hand, to the routine workings of the Surplus Property Act.

Since not all the lands necessary for the Project have yet been acquired, there are substantial in-holdings of private lands in and around the Project area. These private holdings are not now subject to the direct control of the federal government, and unless they were acquired in the period before deauthorization, they would remain free of all direct federal control.

#### XIX.B.3 EFFECTS ON THE OTHER AUTHORIZED PROJECTS

Obviously, there is considerable opportunity for frustration of any future public purpose (particularly recreation use) the Congress might endow on existing Project lands were it to specify a changed public use for those lands. Such potential frustration must be analyzed and planned for should deauthorization occur.

Turning now to the effect of deauthorization on lands which have been made a part of the DWGNRA, Section 1 of the Act establishing the DWGNRA states that:

"the Secretary of the Interior is authorized, as herein provided, to establish and administer the (DWGNRA), hereinafter referred to as the "area", as part of the Tocks Island Reservoir project"

(16 U.S.C. S460o; emphasis added)

The Act elsewhere refers to the recreation area in the context of the Tocks Island Project.

It is understood that elements of the Department of the Army and of the Department of the Interior have expressed divergent views on the question whether a deauthorization of the Tocks Island Project would also have the effect of deauthorizing the recreation area. Such views realistically, must be regarded as hypothetical for it is most unlikely that Congress would remain silent respecting the future of the DWGNRA in any legislation deauthorizing the Tocks Island Project. Indeed, it is the consultants' view that given the deauthorization of the Tocks Island Project, Congress would affirm, at such time, the authorization of DWGNRA without a lake as the proper future use of the area.

In regard to the Kittatinny Pump Storage Facility (PL 91-282) it is assumed that if Congress decides to deauthorize the Tocks Island Lake Project, it will also either explicitly or implicitly deauthorize the pump storage facility. As discussed in Chapter XIV, this pump storage facility could be economically developed without the Tocks Island Reservoir, if the utility companies were permitted to construct a lower level storage pool by means of a shallow gate-type dam some 1,500 feet south of Tocks Island. However, given the environmental controversy which has surrounded the Tocks Island Project and the potential

alternatives available for achieving a comparable level of power generation by other means within the service area, it seems highly improbable that the consent of Congress and DRBC could be obtained for a pump storage facility involving a single purpose dam on the main stem of the Delaware River.

#### XIX.B.4 LEGAL IMPLICATIONS OF THE WALPACK BEND AGREEMENT UNDER DEAUTHORIZATION

The following analysis concerns the legal implications of the "Walpack Bend" agreement between the States of New Jersey and Pennsylvania, under which the State of New Jersey consented to the construction of a dam by Pennsylvania on the Delaware River at Walpack Bend north of Tocks Island. Although this agreement is embodied in the 1954 Supreme Court Decree, the 1962 authorization of the Tocks Island Lake Project by Congress, precluded the need for the State of Pennsylvania to seek federal consent to construct such a facility. If Congress now decides to deauthorize the Tocks Island Lake Project, the legal complications which could arise from this "Walpack Bend" agreement requires analysis, as it will have a bearing on a Congressional deauthorization decision, and the disposal of lands now acquired.

As discussed in Chapter XVII, the provisions of the 1954 Supreme Court Decree took shape, in large part, from an effort by the Court's Special Master to encourage a "negotiated settlement" among the parties. One of the elements of that "negotiated settlement" was Section V.A. of the Decree (347 U.S. at 1001). That provision reads as follows:

**" V. Diversions by New Jersey Authorized Under Specified Conditions.**

**A. Authorized Diversions.** The State of New Jersey may divert outside the Delaware River watershed, from the Delaware River or its tributaries in New Jersey, without compensating releases, the equivalent of 100 m.g.d., if the State shall not, prior to July 1, 1955, repeal Chapter 443 of the New Jersey Laws of 1953, and if, when the Commonwealth of Pennsylvania accepts the conditions as specified in Section 19 of that Chapter, the State of New Jersey shall join with the Commonwealth of Pennsylvania in requesting the consent of Congress to the agreement embodied in Chapter 443 of the New Jersey Laws of 1953 and an Act of the Commonwealth of Pennsylvania accepting the conditions of such New Jersey Act. "

Chapter 443 of the New Jersey Laws of 1953, referred to in the excerpt just recited, is now codified at New Jersey Statutes Annotated, Sections 32:20-34 through 32:20-52. The Chapter sets forth the details for authorization of, and construction and maintenance of, a storage dam across the Delaware River at or near Walpack Bend. It gives New Jersey's consent to construction of such a facility by the Commonwealth of Pennsylvania, and provides for New Jersey's participation in the project, should it desire to "buy in." The authority therein granted does not expire for fifty years from the effective date of the New Jersey Statute. That expiration date is June 28, 2005.

Section V.A. of the 1954 decree, then, conditioned New Jersey's right to withdraw 100 m.g.d. from the Delaware on its commitment not to repeal the statute just described (i.e., Chapter 443 of the New Jersey Laws of 1953) before July 1, 1955. It fulfilled that commitment. The decree also required New Jersey to join with the Commonwealth of Pennsylvania in requesting the consent of Congress to the agreement embodied in the New Jersey statute, i.e., the agreement to support and participate in the construction of a dam near Walpack Bend. That never occurred.

After Pennsylvania accepted the terms of the New Jersey statute on June 28, 1955 (32 P.S. Section 815.47), there were two severe hurricanes and a serious flood on the Delaware. Congress ordered a survey of flood control, water supply and related problems in the Delaware Basin area, and the Tocks Island site came to the fore. The State of Pennsylvania asked specifically that the Walpack Bend site be compared with the Tocks Island site. In February, 1957 the Corps of Engineers reported back to the Governor of Pennsylvania that Tocks Island was the better site because of greater storage potential, lower costs, enhanced recreational opportunities and other reasons.

In 1962 Congress authorized Tocks Island. In effect, Tocks became the substitute for Walpack Bend, and if Tocks is constructed it can be assumed that the State of Pennsylvania will not want to proceed with a Walpack Bend dam of its own. Section V.A. of the decree then becomes somewhat academic.

However, if deauthorization of the Tocks Island Project should occur we are thrown back to Section V.A. of the decree. Should Pennsylvania then decide to construct "... a storage dam across the Delaware River at or near the area known as Walpack Bend, but above the confluence with Flatbrook...", New Jersey is bound to honor its commitment to support such a project as a pre-condition to withdrawal of its 100 m.g.d. New Jersey would have to join with Pennsylvania in seeking the consent of Congress to such a project, and would have to purchase or condemn the necessary lands on the New Jersey side for the project. Pennsylvania would bear the costs of such condemnation, unless New Jersey had exercised its right to participate in the construction of the project by acquiring a share thereof (no larger than 30 per cent), in which event New Jersey would have to bear its proportionate share of the costs.

Of course, Congress might refuse to consent to a Pennsylvania-New Jersey Walpack Bend Dam or DRBC could refuse to grant a construction permit despite the good faith efforts of New Jersey and Pennsylvania to obtain approval. In that event a Walpack Bend dam could not proceed.

Although this series of events seems tentative in light of the fact that the Congress has now stepped into the Delaware Basin flood control and water supply situation with a strong commitment of federal participation and funding. However, should Congress decide to end that commitment, Pennsylvania could conceivably fall back on the original Walpack Bend project. In that event, New Jersey is committed to take the actions which the 1954 decree mandates, as discussed above, in order to maintain its 100 m.g.d. diversion right under the decree.

It should be noted that the Corps, in their "Delaware River Basin Report", evaluated a potential dam site at Walpack Bend. They found that the site at Walpack Bend would be more costly than a multi-purpose dam at the Tocks Island site some 10 miles downstream. According to the Corps' investigation, the dam at Walpack Bend could provide roughly the same flood control protection as Tocks but at 1.7 times the cost. Moreover, to provide equivalent water supply to Tocks, a secondary dam on the Flatbrook would be required which would raise the water supply storage costs at the Walpack site to three times that of Tocks Island.

### XIX.C. GENERAL ANALYSIS OF DEAUTHORIZATION OPTIONS

The legal analysis of deauthorization points to the need for Congress to clarify the status of the DWGNRA and current federal land holdings should the Tocks Island Lake Project be deauthorized. In evaluating the impacts, however, one cannot second guess the Congress and must discuss several options. The two principal options are to deauthorize not only the Tocks Island Dam and Lake, but the recreation area as well; the second is to permit DWGNRA to continue without the lake. The first option gives rise to the basic question of the disposition of land acquired and its impacts; the second involves the consideration of whether the land acquisition must be completed for the recreation area and the differential impact on the local communities which would result if DWGNRA alone is developed. These basic options provide the outline for the general discussion of the impacts of deauthorization which follows.

The above options are predicated on two assumptions. First, is that while Congress could decide to deauthorize only the recreation area leaving TILP to be developed by the Corps without an upland recreation component, this is not likely to occur. Historically the deauthorization of Park Service projects is rare, and only occurs when a particular project no longer serves the purpose for which it was originally established. Based on the recreation analysis in Chapter XVIII, it can be concluded that both the lake and the river based alternative recreation areas can be designed to comply with the NPS guidelines for a national recreation area. Also in this particular case it can be assumed that Congress would be extremely reluctant to deauthorize one of the initial designated national recreation areas, especially as a similar recreation facility developed by Corps would generate comparable impacts for equivalent design loads. Second, it is

assumed that the development of the Kittatinny pump storage facilities is directly related to the ultimate decision regarding whether to proceed with the Tocks Island Reservoir. If TILP is deauthorized it is assumed that the pump storage facility could not gain congressional or DRBC approval for the reasons cited previously in Section XIX.B.3, even though it would be economically feasible as indicated in Chapter XIV. Based on these assumptions, the analysis which follows focuses on either total project deauthorization or the deauthorization of only TILP.

#### XIX.C.1 DEAUTHORIZATION OF BOTH DWGNRA AND TILP

This course of action is considered unlikely and would involve the total disposition of all lands acquired. As was noted in the legal analysis, if the land disposition question were not specifically addressed by Congress, disposition would take place in accordance with the Federal Property and Administrative Services Act of 1949. In either case, the options for disposition of the land are essentially same. That is, the land may be offered to: 1) other federal agencies, 2) state, multi-state or local governments, 3) conservation-oriented private interests such as the Audobon Society, Sierra Club, Nature Conservancy or others, or 4) returned to the private sector for private development.

##### Public Sector Option

From the choices above it is highly unlikely that another federal agency would be selected to administer property since the National Park Service has already initiated planning and development of a recreation area on the site. There has been no expression of interest by any other agencies for such projects as an experimental farm, federal prison, military base or other non-recreation activity - nor is this anticipated. Transferring the lands to the states or a

multi-state agency for operation of a recreation area would produce a situation similar to DWGNRA without a lake. There may however, be some problems associated with coordinating the states, a lower level of expenditure for recreation facilities (recognizing the states' budgets) and a somewhat lower level of patronage because of this.

Private Conservation Groups

Transferring the land to such organizations as the Audobon Society, Sierra Club, Nature Conservancy or a major foundation is possible but unlikely since such organizations are more interested in preserving land that might otherwise be committed to private development - an objective that has already been achieved by the government's purchases in the Tocks Island area. In the event that this option takes place, one would anticipate a greater emphasis on preserving the natural environment and passive recreation activities.

Sale to Private Sector

Converting the land back to private ownership is the least plausible of all the options. It would be extremely unpopular among the local residents since it would be virtually impossible to return land to the original owners in every case and could pave the way for a wave of development pressures which the local community is less prepared to handle than the lake project itself. This land is some of the most suitable in the area for residential and resort development and only the authorization of the Tocks Island Project and DWGNRA have prevented the development of the River valley for second homes, resorts, and tourist centers which has occurred throughout the Pocono region. Private ownership of land would, however, restore some of the lost tax base and would permit the reconstitution of some of the governmental functions of the townships which have already been impacted by the acquisition.

Scenic River Designation

As previously noted in Chapter XVIII, the Upper Delaware, in a reach of about 75 miles from Hancock, New York to Matamoras, has been submitted for official designation as a Scenic and Recreational River in the National Wild and Scenic Rivers System (PL 90-542). At no time has the stretch of river from Matamoras to Delaware Water Gap been considered for this designation because that portion of the river has been included in an authorized impoundment behind Tocks Island Dam. The Wild and Scenic River Act (PL 90-542) states that "every wild, scenic or recreational river in its free flowing condition, or upon restoration to this condition, shall be considered eligible for inclusion in the national wild and scenic rivers system." In order to be included in the system, the river must be a free flowing stream and its immediate environment must possess one or more of the following characteristics: "outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values."

According to "Upper Delaware River - A Wild and Scenic River Study" prepared by the Bureau of Outdoor Recreation, the Upper Delaware should be included in the Wild and Scenic River System because it:

- 1) is in a free flowing condition,
- 2) possesses outstandingly remarkable scenic, recreational, fish and wildlife values,
- 3) is long enough to provide a meaningful recreation experience, and,
- 4) has water of a high quality and volume which generally meets the minimum criteria for desired types of recreation.

Because the lower section of the Delaware possesses similar qualities and would appear to meet the minimum eligibility requirements delineated in the Wild and Scenic River Act, it would be worthy of serious study for inclusion in the Wild and Scenic Rivers System.

The purpose of the Act, to preserve the river's character, could be achieved by acquisition up to the 100 acre per mile limitation, zoning or purchase of scenic easements. Section 10(c) of PL 90-542, states that any component of the Wild and Scenic Rivers System that is administered by the Secretary of the Interior through the National Park Service shall become part of the National Park System.

A land use and recreation management arrangement similar to that proposed for the Upper Delaware component of the Wild and Scenic River System would be possible under total project deauthorization. In this arrangement, land uses would be regulated through local, state, and DRBC control mechanisms and recreation would be managed by the National Park Service. The NPS 1973 Environmental Impact Statement for the Upper Delaware Wild and Scenic River System listed a three-phased land management process consisting of 1) a temporary moratorium on further subdivision and development permits, 2) adoption of local zoning, and 3) local implementation of a land use guidance system. DRBC would strengthen, support and integrate local action by granting permits on the basis of a land use plans and overall water quality goals.

As discussed in Chapter XVIII, this option would not be feasible in case of the continued operation of DWGNRA. The intensive recreational use which accompanies a National Recreational Area is incompatible with the goals of the Wild and Scenic Rivers System.

#### XIX.C.2 DEAUTHORIZATION OF TILP WITH CONTINUATION OF DWGNRA

If the Tocks Island Lake project is deauthorized it is likely that DWGNRA will continue to exist either due to existing authorizations or by explicit

Congressional action. The question still remains, however, whether Congress would appropriate more funds to complete the purchase of the remaining lands within the DWGNRA boundary.

No Further Acquisitions

According to the National Park Service, it would be impossible to have a viable recreation area administered by the National Park Service with the present pattern of acquisition. The discontinuity of acquired parcels and the large amount of unacquired land actually fronting on the river still jeopardizes not only the ability to plan and manage the recreation area but its basic purpose as well. Many of the alternatives now under consideration by the National Park Service and discussed in Chapter XVIII, would be completely infeasible if a major portion of additional properties were not acquired, and the existing holdings consolidated.

The large number of remaining private parcels, some of which are completely surrounded by park land and on the river would become extremely attractive for private development and would likely create planning, administrative and service problems for both the local municipalities and the National Park Service. Also the local communities would continue to be burdened with the fiscal responsibility of providing municipal services to the isolated properties.

DWGNRA With Additional Acquisitions

The most likely alternative if deauthorization of the Tocks Island Lake project occurs, is the continued development of the DWGNRA to its originally planned dimensions - (or at least a cohesive ownership pattern) and oriented to river-based and upland recreation activities. This would give rise to the options and comparisons discussed in Section XVIII. The primary difference in social and economic impacts between the river-based and lake-based recreation will be

a function of patronage levels, the duration of the peak tourist season, the characteristics of the visitors, and the nature of the commercial activities stimulated in the community.

#### XIX.D. IMPACTS OF DEAUTHORIZATION

Based on the general analysis of the two primary deauthorization options in the preceding section (deauthorization of both TILP and DWGNRA, or deauthorization of only TILP), this section summarizes the secondary impacts of the latter, utilizing the information contained in Chapters XVIII, XXII and XXV. Included here is an impact summary of the social and economic, transportation, land use, environmental, and institutional effects of TILP deauthorization, assuming the development of DWGNRA as a river-based recreation area.

The major direct impacts of TILP deauthorization will be the loss of the water supply, flood control, and electric power needs for which the project was authorized, and the lake recreation facilities. Future demands to be placed upon the resources of the Delaware River Basin and service areas with respect to the authorized purposes for TILP, are projected and discussed in Chapters II through V of Part A. The capability of alternatives to provide or develop resources to meet these needs are presented in Chapters XII through XV of Part C, and in the alternative program packages presented in Chapter XVI.

The elimination of TILP from the National Recreation Area would reduce the total potential number of future user visits of the park. Specifically, the elimination of lake boating and the substantial reduction in swimming will significantly reduce patronage for two reasons.

First, is the degree of public participation in various activities. According to the 1972 National Recreation Survey conducted by the Bureau of Outdoor Recreation, more than 7 to 10 times more people participate in swimming (not including swimming in pools) than participate in remote camping or hiking, and five times as many participate in general boating than canoeing.

Second, is the visitor capacity. As discussed in Chapter XVIII, the "instant" visitor capacity of the DWGNRA ranges from a low of 18,555 without a lake to 109,000 with a lake under the various alternative recreation area plans reviewed in that Chapter. Based on these capacities, the annual visitation to a park without a lake would be between 1.85 million and 3.2 million and with a lake could range from 4 million in Phase I to 10.6 million in Phase III of the Clarke and Rapuano Plan.

#### XIX.D.1 ECONOMIC AND SOCIAL IMPACTS OF TILP DEAUTHORIZATION

Chapter XXII suggests that the effects of the Project on the social and economic features, growth patterns and public services in the seven county area, is related to the annual visitation and design of the recreation nodes within the park. A significantly lower annual visitation rate that would occur under DWGNRA without a lake, would logically result in decreased impacts on the surrounding community. The difference in impact intensities is discussed in Chapter XVIII in the evaluation of a range of park plans. The attempt here is to summarize differing secondary effects of a park with and without a lake. For purposes of this discussion, the effects have been divided into seven general categories:

- Calm Surface Water Recreation Opportunity
- Park User Service Facilities
- Employment
- Permanent Settlement
- Land Value Implications
- Community Facilities and Services
- Community Lifestyles

The implications of deauthorization of TILP and the elimination of the lake from the park component would significantly influence several of the impact categories listed above as discussed below. The specific effect would depend on whether supporting facilities and intra-park public transportation are provided in an activity node or whether they are scattered and depend on traditional auto distribution methods. The differing effects of these two basic approaches on park functions and secondary impact categories are noted as appropriate.

#### Calm Surface Water Recreation Opportunity

Direct and empirical cost benefit analysis attempts to quantify the benefits of recreation facilities in terms of the average dollar value for each user and thus the aggregate user benefit. This aggregate user benefit is quantified elsewhere in this report and qualitative judgements as to the outcome have been presented earlier in Chapter XVIII, including an evaluation of the differences in recreation activities and user types.

Deauthorization of TILP will have a substantial effect on the nature of the recreational experience within the park and the park's capacity to meet regional needs for swimming and boating. As discussed in Chapter XVIII, the facilities for swimming and boating would be significantly less without a reservoir. Fewer water based facilities will tend to disperse visitors throughout the park area, and place greater relative emphasis on other activities such as hiking or camping. The recreational experience without the high visitor concentrations and "developed" facilities associated with the lake will be more attuned to the area's natural features, depending on the final NPS plans for a river-oriented recreation area.

Due to the reduced capacity for swimming and boating, deauthorization would divert demand for calm surface water activity to other facilities in the region.

#### Park User Service Facilities

Park users' service facilities include second homes, recreation supply enterprises, other park-user-primary-support enterprises and park user partial support enterprises. The affect of deauthorization on each of these components is summarized below.

As discussed in Chapter XXII, the development of TILP/DWGNRA would accelerate the second home "build-out" rate, but would not have a significant effect in inducing totally new second home developments. Conversely, the deauthorization of TILP will reduce the expected acceleration in the rate of second home construction in the area as the extended and repeated visits associated with a major boating and swimming facility would be reduced. Under deauthorization, the current backlog of plotted but unused lots will probably provide an adequate range of sites for second home construction for the next several years. It should, of course, be noted that with second homes, as will all land uses, the potential development created may or may not be realized depending on increasing construction costs, the general state of the economy, utility extensions, and other growth determinants.

The demand for recreation supply enterprises and transit primary support establishments such as motels, restaurants, entertainment and cultural facilities would be less for a river-based park. Even the reduced demand, however, could support such facilities if the park was designed to concentrate visitors at one or two market locations at some point during their trip.

The transit-partial support enterprises are those types of businesses such as food, drug and hardware stores which would continue receiving their major support from the permanent resident population but would attract a substantial additional increment of sales and/or business activity from the park generated visitors. Since lake-oriented park visitors tend to be less fully self-equipped than hikers and campers, their propensity to need and use the services of these enterprises would be greater than a mere proportional expansion related to total visitation levels.

As described in detail in Chapter XXII, the development of TILP and DWGNRA and a visitor level of 4.0 million will support some 111 new establishments providing services and products in transportation, lodging, food, entertainment and gifts and incidentals. If the total visitor volumes are assumed to reach a peak of 10.6 million annually, some 338 new trade and service establishments can be expected to be created in the primary economic impact area over the 1985-2000 period. The deauthorization of TILP, obviously, will change the mix and scale of new economic enterprise development in the seven county impact area and would reduce the potential demand as indicated in the Chapter XVIII Table 18-17 comparison of expected revenue which would be generated by a range of alternative recreation area plans and visitation rates.

#### Employment

The development of TILP and DWGNRA, as described in Chapter XXII, will generate 1,960 direct employment opportunities and 985 indirect jobs totalling to some 2,945 new job opportunities by 1985 for Phase I development. Obviously, if TILP was deauthorized, resulting in equal or somewhat less visitation level, the primary and secondary economic impacts upon the seven county area would be correspondingly reduced. The resultant greater proportion of day visitors from a somewhat smaller geographic region will tend to reduce the total number of jobs that would be generated with TILP.

#### Permanent Settlement

The creation of some 2,945 new jobs during the Phase I (4.0 million visitor level) would support 5,890 additional persons and attract some 2,000 additional households to the seven-county area. If the TILP/DWGNRA visitations reach 10.6 million by the year 2000 (Phase III), some 18,110 people and 6,450 new permanent households will be attracted to the area.

Permanent housing and population will, on the whole, not vary significantly whether there is lake based or river based recreation. However, there are some distinctions which should be considered. In both cases, the park will attract a relatively small number of retired and commuter residents. The retired population will not make their housing locational decision based on what kind of water facilities exist within the National Recreation Area. On the other hand, the commuter population, especially the younger commuters, may tend to be more favorably inclined towards a park with a lake than with a river because of the active recreation opportunities.

Another population group which would affect demand for permanent housing is the employees of the National Park. The lake park would require approximately twice as many permanent employees as would the river park. Thus, without the lake, there will be fewer permanent employees and consequently, relatively less demand for employees' housing. But since some of the housing will be provided within the park, the difference in permanent housing demand is slight.

#### Land Value Implications

In spite of the widespread belief that public land acquisition greatly reduces the local tax base, some recent experience in such areas as Lake Lanier indicates a substantial increase in land values near recreation facilities. Increases

in property values are associated with proximity to the park and with the suitability of the land for subdivision. It is reasonable to expect that increased land values in the vicinity of a man-made lake may not be sufficient to offset the loss due to land taken from tax rolls for public recreation but the very high demand for lands adjacent to this type of park greatly increases land values and thereby reduces the net tax loss. By changing the nature of the park to river-based recreation, it would be reasonable to expect property values adjacent to the park not to rise as quickly as with a lake. Thus, without TILP, DWGNRA will not have a strong positive impact on the tax base. In addition, the reduced demand for commercial space without TILP will be reflected in a reduction of potential property tax revenues.

#### Community Facilities and Services

The ultimate patronage levels under the river park option have been indicated to be significantly less than those of the lake park. Fewer visitors will correspondingly demand less services such police, fire, medical, garbage, and road maintenance. Depending on the tax base and the river park development scheme, there may or may not be better service provided with lower visitation levels. In the first place, an analysis would have to be made of the expected tax rolls to see to what extent property values will go up or down. Where property values rise rapidly the municipalities may be able to provide more and better community services per visitor with TILP than under the river park option. Another factor to consider is the type of development scheme adopted within the river park. If the visitor activity is clustered it is more economical to provide the needed police and fire protection and medical services.

### Community Lifestyles

As shown in Chapter XVIII, TILP will attract more permanent residential housing growth than a park without a lake. Increased demand for land near the park would tend to increase land value and therefore the property taxes of existing residents. Similarly, the increased demand for goods and services associated with a large visitor population would tend to drive up prices in areas with a high visitor population. Without TILP, the price structure would tend to be more constant and reflect normal growth and cost increases.

The growth associated with the visitors and permanent residents moving to the impact area will affect the fabric of life. The transition from a rural life style, characterized by primary relationships and a simple economy to a busier more "suburbanized" community with a greater diversity of people and services will be accelerated and be more pronounced under TILP. With deauthorization, the changes that occur will be more related to normal growth patterns currently occurring than to the national recreation area.

### XIX.D.2 LAND USE IMPACTS OF TILP DEAUTHORIZATION

The deauthorization of TILP will have a secondary effect in accelerating the development of non-structural and structural controls in the floodways below the dam and limit the future potential for development of the flood hazard areas. A discussion of federal and state legislation and programs for managing land use in floodways is presented in Chapter II and the effect of a range of non-structural flood control alternatives are evaluated in Chapters XV and XVI.

Currently, municipalities identified as having flood prone areas are required to develop a land use control program and building permit system based on flood plain delineations by the Corps and the Soil Conservation Service in order to qualify for the National Flood Insurance Program administered by H.U.D. Two municipalities, Trenton and Burlington, have had flood plain delineation studies completed and are already implementing their plans for existing hazard areas. While HUD has established a deadline for communities to develop a land use management program to qualify for federal insurance, deauthorization of the dam may increase pressure on the other communities to complete their plans earlier. Ultimately, Project deauthorization would limit future development in flood hazard areas to low density or open space uses as determined by flood plain legislation and zoning. The regulation of land uses by a non-structural flood control programs will affect the future growth patterns, the tax base and budgets of the municipalities involved.

In the seven county impact area, the deauthorization of TILP will reduce the land use development impacts indicated in Chapter XXII. A river-based park with a series of recreation nodes such as in the NPS river recreation area Plan reviewed in Chapter XVIII, would not involve the high concentrations of visitors that would accompany DWGNRA with a lake. As discussed in Chapter XXII, the retail establishments generated by a lake recreation area, such as the Clarke and Rapuano Plan, would locate on major access routes primarily near the major park entrances to the recreation facilities. Deauthorization would generally reduce commercial/retail development demand and distribute these uses within existing development patterns.

In addition to generating less growth, deauthorization would reduce the rate of growth, as noted previously. By extending growth over a longer period of

of time, communities could gradually adjust to development pressures, especially if highway improvements are implemented in stages. Chapter XXII discusses the growth patterns in the seven county impact area and the effect of DWGNRA with TILP on land use. Deauthorization of the dam and lake will not significantly change the patterns of growth projected. The principal differences will be reflected in the rate at which central sewage and water systems are developed, public services expanded, and roads improved. The slower growth rate with deauthorization of TILP will allow communities to exert greater control over their infra-structure improvements and will tend to concentrate development in terms of existing settlement patterns.

The most significant impact related to TILP deauthorization would be caused by increased demand for public lake recreation. Areas around existing natural and man-made bodies of water will experience increased recreation development pressure in the future due to the loss of DWGNRA lake facilities. Potential recreation alternatives to compensate for the loss in swimming and boating due to TILP deauthorization are presented in Chapter XIII.

Although it has been assumed that the balance of the lands would be acquired for the recreation area, it is possible that the National Park Service might consolidate holdings without 100% acquisition by "exchanging" their fringe properties for privately owned "in holdings". If such a procedure is adopted, attention should be directed to controlling development on the "exchanged" fringe properties. Also under this procedure, the future economic viability of those townships originally scheduled to be totally acquired must be addressed. Currently, Walpack and Pahaquarry cannot maintain essential services due to

an inadequate tax base. If this situation continues, they would either continue to deteriorate or would be forced to merge with adjoining townships to maintain essential public services. A similar situation exists in the unincorporated Town of Bushkill in Pennsylvania, but to a lesser degree as an entire township is not being acquired.

#### XIX.D.3 TRANSPORTATION IMPACTS OF TILP DEAUTHORIZATION

The TILP deauthorization will be directly reflected in the amount of traffic generated and the highway improvements required to accommodate it. However, as detailed in Part E Chapter XXV Sections B.2(c) and C.4., substantial improvements and additions to the existing highway system will be required to accommodate normal traffic growth, the principal source of traffic generation in the future. As mentioned in Chapter XXV, most of the recreation area users will travel by private auto. With TILP, it is estimated that 90 percent of the visitors will use private auto, and 10 percent will utilize public transportation. Without a lake, the types of traffic effects that can be anticipated are not only the product of reduced visitation, but of other factors which will influence the overall reduction in volumes. These include daily and seasonal distribution of traffic on the approach routes due to changes in origin patterns, changes in the vehicular composition of the traffic, and ability to support public transportation systems. A recreation area without a lake, or water oriented recreational activities will attract significantly fewer persons to the area at a specific time interval. Peaking characteristics of vehicular traffic bound for a beach are much sharper than those bound for an outing in the woods,

camping or hiking, and the likelihood of weekends being the focus of these activities is also reduced. With regard to seasonal variations, swimming and boating are much more dependent on warm weather than woodland related activity. There will be a longer season for the latter and less likelihood for such usage to be concentrated on warm days, when water oriented facilities would be more attractive. These characteristics of recreational travel are more fully discussed in Chapter XXV Sections A.1(e) and B.2(b).

There will also be significant differences in origin patterns of users of water based and non-water based recreational activities. Swimming, boating, and fishing will be more attractive to the residents of urban areas which do not have comparable nearby facilities. The approach roads linking these urban areas to major beach facilities will become over-utilized. For a recreation area without a lake, a larger percentage of the patrons would be seeking woodland-type activities, and would originate from more widely dispersed origins throughout the recreation area than the lake users.

Deauthorization of TILP would also affect the mix of vehicles. The absence of a lake would eliminate the boat trailers, and reduce the number of recreation camping trailers which might come to the area for an extended stay.

Another factor of significance in traffic patterns for recreation areas is the effect of sudden changes in the weather such as a thunder storm. Lake related activities, such as swimming and boating, are subject to abrupt departures of large numbers of persons when a thunder storm arises causing massive traffic jams. While this does not occur more than a few times a year, it has a major impact

on the attitudes of the local residents. The patrons attracted to a recreation area without a lake would be less likely to react in the foregoing manner. These extreme weather conditions are not considered a factor in normal highway planning, as the thirtieth or fiftieth highest hourly volumes of the year are the standard determinants used for design. Also, a recreation area without a lake will reduce both the demand and concentration of activities needed to support public transportation services, as it would tend to disperse the concentration of activities needed to support public transportation to the area.

The reduced patronage will also directly effect the highway improvements and expenditures required. Depending on the intensity of the facilities development in a river oriented recreation area, it is highly probable that the total annual visitation will not exceed the four million figure established by DRBC as a maximum beyond which extensive highway improvements would be required in addition to those included in the New Jersey Highway Master Plan (1972). In effect, most of the planned improvements are necessary to accommodate normal growth within the next twenty years as indicated in Chapter XXV Section C.4. Without a lake, an additional crossing of the Delaware would be available at Dingman's Ferry connecting Route 251 in New Jersey with Route 739 in Pennsylvania, although the crossing will need to be improved. This would reduce the amount of unnecessary additional travel across the river and reduce traffic accordingly at the Delaware Water Gap and at the Milford end of the highway system. To the extent that this added crossing improves traffic flow characteristics, this will be a beneficial secondary effect of TILP deauthorization.

#### Impact on Highway Improvements

The Army Corps of Engineers has completed initial plans for relocation of Route

209 in Pike County as required by Section 207(c) of the Flood Control Act of 1960. In view of projected growth in the area, Pennsylvania has asked the Corps to design the road for "staged construction" which would permit the State Department of Transportation to add two additional lanes as funds become available. The original Agreement between the Army Corps of Engineers and Pennsylvania DOT may be renegotiated, however, in light of the provisions of Section 13 of the 1974 Water Resources Development Act which could require the federal government to construct the road to meet future needs. The decision will depend on the interpretation of this Act.

Total deauthorization would shift responsibility for improvement or relocation of Route 209 to the State of Pennsylvania. The State acknowledges that the improvement is necessary to meet current and future traffic needs, but that its planning and implementation is dependent on the availability of funds. Under the 1973 Highway Assistance Act, the federal government would pay for 70 percent and the State would pay for 30 percent of the total improvement costs, if TILP is deauthorized and the relocation of Route 209 is no longer a federal obligation.

Currently, there are no contingency plans for financing the improvement or relocation of the Highway if only TILP is deauthorized. However, the National Park Service has said that administration of the recreation area would be difficult if Route 209 were retained in its present location and Pennsylvania DOT believes relocation to be necessary for road improvement.

New York State has not planned any improvements in connection with the recreational area or the Lake Project. It is estimated that the impact of these projects on the highway system in New York State would not be significant. The planned im-

provement of Route 209 in New York to a four lane divided highway would not be affected by the deauthorization of the lake. This improvement does not carry a high priority. There are no other projects planned except the improvement of Routes 284 and 94, which depend on the action taken by New Jersey.

#### XIX.D.4 ENVIRONMENTAL IMPACTS

The environmental impacts of TILP deauthorization can be divided into two categories, those within the recreation area and the Delaware River, and those external to the recreation area. Some of these will have an effect on the local community environment; others will not, and where appropriate this distinction has been noted. Under any set of options for the deauthorization, the major environmental impacts result from the park.

The internal impacts include the following. The aquatic impacts of TILP deauthorization are the loss of the benefits of lake fishing, estimated in Chapter IX as 384,000 annual man-days. The current annual benefits of 40,000 man-days of river fishing and the cleansing action of a river would remain. The preserving of 10,500 acres of low land would preserve the terrestrial biota of the area along with two specialized habitats for tributary trout fisheries and fresh water marshes. TILP deauthorization would assure the beneficial impact of a free-flowing stream for shad migration and would retain the endangered flora species and unique vegetation found in the area. The external impacts include the following. TILP deauthorization will result in lower NRA patronage, less traffic, and hence, the resultant gain in noise and air quality impacts.

Perhaps, the most critical external impact is the water pollution issue, particularly in the upper basin. Water quality considerations and effects are treated in detail in Chapter VI in Part A and in Chapter IX in Part B. The affect upon water quality is associated with sewage effluents and non-point pollution sources, which are regulated by federal standards (PL 92-500). Under baseline conditions, secondary treatment of nutrients related to eutrophic algae is required to comply with federal and DRBC water quality standards. With TILP, additional nutrient removal above the level of secondary treatment may be required to achieve satisfactory water quality as noted in Chapter XXII Section C.5. With TILP deauthorization, secondary treatment is satisfactory in accordance with DRBC standards. In summary, a higher level of liquid waste treatment in the contiguous and some upstream portions of the Delaware, will mean higher treatment costs with TILP.

Solid waste collection, recycling or disposal is a significant environmental impact directly related to the level of patronage. Without TILP, the impact is less significant due to the reduction of visitation. This impact could be mitigated further by the NPS locating landfill sites within the DWGNRA lands rather than relying on contracts with surrounding municipalities, further overburdening their external landfill sites. It is generally assumed that solid waste is generated at 2.5 lbs./day/person.

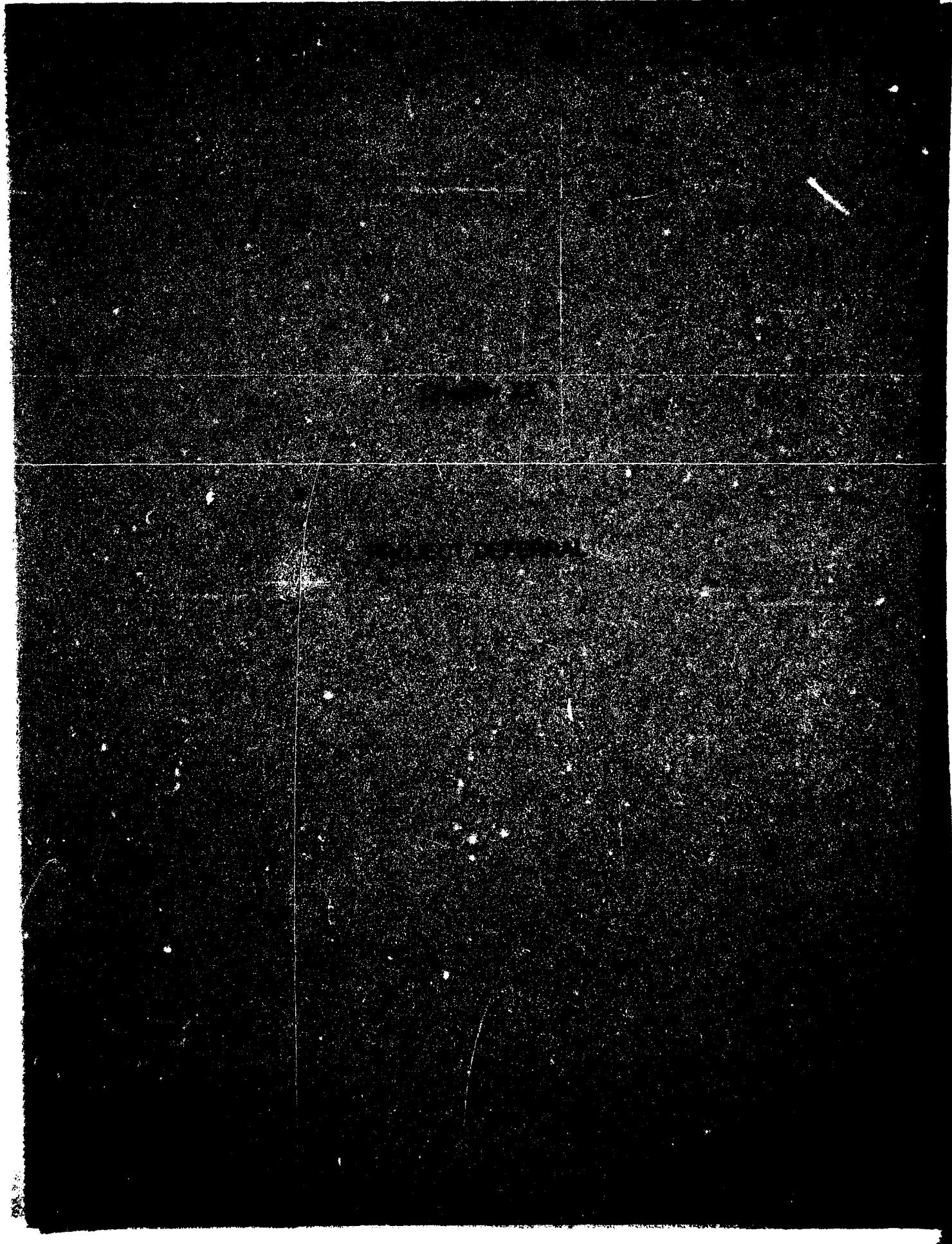
#### XIX.D.5 ARCHEOLOGICAL AND HISTORIC RESOURCES

A variety of significant archeological and historic resources are scattered in the proposed impoundment area within the park boundaries, and in the general

vicinity of the project. The general historical significance of the area, the inventory of the historic and archeological sites, and the effect of the impoundment are described and evaluated in Chapter XXII Section C.5. The environment impacts of the construction of TILP are presented in Chapter X, Section X.A.6. If it is decided to deauthorize TILP, those structures and archaeological sites of historical significance within the impoundment area could be preserved, dependent on Park Service plans and maintenance funding.

#### XIX.E. SUMMARY

In summary, only Congress can deauthorize the Tocks Island Lake Project. If it decides to do so, it should address the question of the status of the related authorizations creating the DWGNRA and the pump storage facilities, and the related question of the disposal of lands acquired. If Congress were to deauthorize TILP and not address these questions, the future of the other authorized components of the project would remain in doubt, and the fate of the land acquired would be left to the routine workings of the Surplus Property Act. Based on an analysis of alternative options for the disposal of these lands, it is the consultant's opinion that if Congress should decide to de-authorize TILP it also should re-establish the authorization for the recreation area as the proper public use for the lands and make provision for the completion of the land acquisition process.



Since the initial authorization for the Tocks Island Lake Project in 1962, the project has been delayed by a series of environmental concerns and public controversy. The Corps of Engineers (COE), in their original project formulation report (House Document No. 522, 87th Congress), stated that the construction of the dam and the filling of the reservoir would be completed in 1975. The COE now estimates, in their 1975 Budget Report to Congress, that the dam and filling of the lake will not be completed until 1983, some eight years after the original estimated completion date. This project delay of eight years has produced a series of impacts, analogous to those which might be experienced under a project deferral situation such as that being considered here.

In this chapter the legal and institutional constraints on deferral are analyzed and the effect of an extended deferral period is considered from the standpoint of the project's benefits and costs, Federal interests, DWGNRA and other impacts. Since the implications of deferral are largely financial, the focus of this chapter is an analysis in terms of deferred costs and deferred benefits based upon the B/C analysis presented previously in Section XVI.B. For this purpose, deferral periods of 10 years and 20 years are used.

## XXA. LEGAL AND INSTITUTIONAL ASPECTS OF DEFERRAL

The Congress could defer the Tocks Island Project in two ways: first, by doing nothing at all - enacting no legislation which affects the Project and appropriating no money for land acquisition or construction - and second, by explicitly passing legislation saying the Project shall remain authorized but shall be held in limbo while studies are carried on.

Under both deferral methods all lands then owned by the United States, whether managed as part of the DWGNRA or as part of the Reservoir Project itself, remain in federal ownership, and under federal control. Although there might be political repercussions and public outcry about delay or indecision, a decision by Congress to remain in a holding pattern results in no change in the status or title of the lands then condemned or acquired for the Project or the DWGNRA. Of course, the Corps and the Park Service will need some funding to provide minimal maintenance and management of the lands at issue, but a Congressional refusal to provide such housekeeping funds seems improbable.

If Congress were to take the first deferral approach and do absolutely nothing, the provisions of the Water Resources Development Act of 1974 (as discussed in Chapter XIX on deauthorization) would come into play. Eight consecutive years of no appropriations for Tocks Island would put it on the Corps' "deauthorization list," after the Secretary of the Army, acting through the Chief of Engineers, determines that the project "should no longer be authorized," and failure of both the House and Senate Public

Works Committees to pass a resolution, within 180 days of submission of the list to Congress, affirmatively continuing Tocks Island's authorization, would result in its automatic deauthorization.

If Congress were to take the second deferral approach and enact legislation explicitly deferring the Project, but not deauthorizing it, the provisions of such deferral would probably supercede the automatic mechanism of the 1974 Water Resources Act. Of course, the best way for Congress to deal with that mechanism would be to legislate its non-applicability to Tocks Island.

Since, under either deferral approach, the Project lands remain in federal ownership and retain their authorized status as part of the Tocks Island Project and/or the DWGNRA, the lands would not become subject to the Surplus Property Act, discussed in the Deauthorization Chapter XIX, or to the regulations enacted thereunder providing for disposition or exchange of excess or surplus lands.

It has been assumed that the DWGNRA will continue to exist, for purposes of analyzing this deferral alternative. Therefore, the hypothetical question of whether the DWGNRA can legally continue to exist without an "ongoing" Tocks Island Project need not be discussed. Again, it is difficult to imagine that if Congress decides on explicit deferral of Tocks Island, it will not address the future of the DWGNRA. This is addressed in some detail in Chapter XIX.

As for the Corps' continued management of the Project-acquired lands, deferral simply turns their management into a "passive" housekeeping operation while Congress ponders the future of the Project. The Corps will need a minimal appropriation to maintain lands under their jurisdiction, and the Congress has ample authority to provide such funds, appropriately conditioned to prohibit their use for land acquisition or Project construction.

## XX.B. BENEFIT-COST IMPLICATIONS OF DEFERRAL

### XX.B.1. INSTITUTIONAL OPTIONS

The preceding legal analysis described two different institutional types of Project deferral, one by default and the other by explicit intent. The latter is considered the most likely and would in turn present Congress with two options. The first is to defer TILP for a set number of years, say 10 years for the purposes of analysis, at the end of which a future evaluation or study would be made to determine whether to proceed with construction, or deauthorize the Project. The second is that a determination is made in advance to defer the construction of the Dam for specific reasons and for a definite period of time, at the end of which it would proceed with construction. In either case the same degree of future uncertainty would probably exist. As previously noted, it is assumed for both options that the acquired lands would become operational as a recreation area, administered by the Parks Service. The only remaining questions are whether the balance of the lands would be acquired or not, and if so by whom. The legal analysis has

suggested that Congress would be derelict in not clarifying such points in the case of explicit deferral.

#### XX.B.2. BENEFIT-COST IMPLICATIONS

An important impact of the deferral would be on the benefit and cost calculations of the project. Deferral for a period of 10 or 20 years would impact the project primarily in terms of total costs and total benefits since both would increase at essentially the same rate. However, the deferral action would result in the potential for reducing the benefit-cost ratio for several reasons.

First, the current cost of the project would have to be carried forward over the projection period with a reduced benefit assigned to the interim use. Second, actual construction costs have been rising in recent years and it is generally conceded that this will continue. Increases in 'some "benefits" are prescribed in the various Congressional documents and may increase at rates approximating those of costs. Third, the investment in riveredge recreation access, and parking facilities would be lost upon flooding of the area and would have to be included at their depreciated value in the benefit-cost analysis at the end of the deferral period.

An indication of the deferral impact on project economics can be gained from looking at the impact of the defacto deferral that has occurred over the

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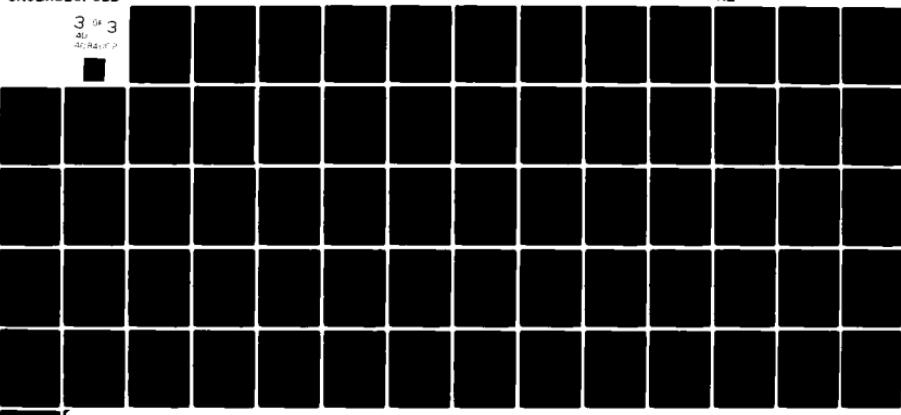
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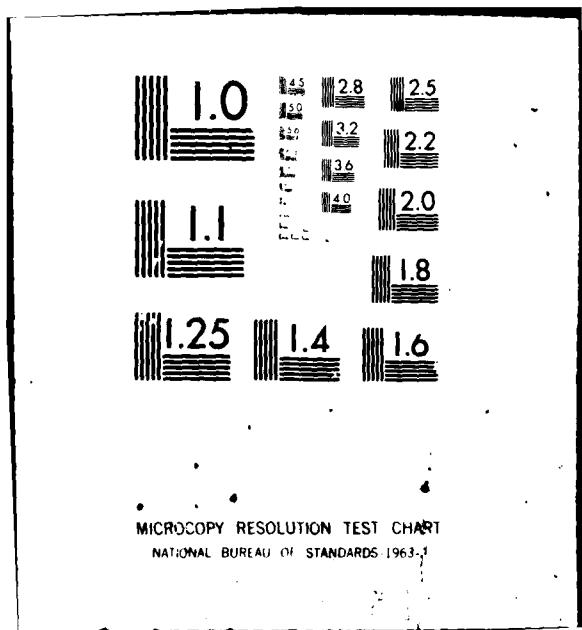
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#### XX.B.2. BENEFIT-COST IMPLICATIONS

An important impact of the deferral would be on the benefit and cost calculations of the project. Deferral for a period of 10 or 20 years would impact the project primarily in terms of total costs and total benefits since both would increase at essentially the same rate. However, the deferral action would result in the potential for reducing the benefit-cost ratio for several reasons.

First, the current cost of the project would have to be carried forward over the projection period with a reduced benefit assigned to the interim use. Second, actual construction costs have been rising in recent years and it is generally conceded that this will continue. Increases in 'some "benefits" are prescribed in the various Congressional documents and may increase at rates approximating those of costs. Third, the investment in riveredge recreation access, and parking facilities would be lost upon flooding of the area and would have to be included at their depreciated value in the benefit-cost analysis at the end of the deferral period.

An indication of the deferral impact on project economics can be gained from looking at the impact of the defacto deferral that has occurred over the

past 12 years. In 1962, the costs for the Tocks Island Lake project were estimated by the Corps of Engineers at \$95 million. By 1974, the basic project costs had risen to \$385 million -- an increase of \$290 million. The average annual cost increase over the 12-year period amounted to approximately \$24 million. Current estimates by the Corps of Engineers suggest that the average annual increase in federal costs for the immediate future will run at approximately \$30 million.

On the benefit side, the major impact of project deferral would involve recreation benefits. As a result of continued development of the National Recreation Area by National Park Service, deferred benefits would be diminished assuming increased patronage at higher price levels with no direct project cost. On the basis of past increases in patronage with limited facilities, it is safe to assume that this trend would continue at an increased rate with more and better facilities. In addition, most river and wilderness recreation activities are charged at a higher rate than lake-based activities thereby increasing the level of current benefits and diminishing deferred benefits. Aside from recreation, it must further be assumed that deferred benefits from the other authorized project purposes (water supply, flood control and electric power) would increase, but at a rate somewhat less than project costs.

The trends in actual benefits and costs and the B/C ratio, as estimated by the Corps of Engineers for the project without pumped storage are shown in the following table.

Table 20-1. Average Annual Benefits and Costs, Tocks Island Lake Project,  
1964-1974

<u>Fiscal Year</u>	<u>Total Annual Benefits</u>	<u>Total Annual Costs</u>	<u>B/C Ratio</u>
1964	11.6	4.9	2.4
1965	11.6	5.0	2.3
1966	12.0	5.1	2.4
1967	12.5	6.9	1.8
1968	13.9	9.1	1.5
1969	14.4	9.1	1.6
1970	22.9	11.3	2.0
1974	23.9	16.9	1.4

Source: From GAO Study, "Review of Tocks Island Reservoir Project," October 1969, Appendix IV, and Corps of Engineers.

During the decade 1964-1974, average annual benefits have increased by \$12.3 million or 106.0 percent while project annual costs have increased dramatically from \$4.9 million to \$16.9 million or 244.9 percent. During this same period, the B/C ratio decreased by 1.0 or -41.7 percent. For illustrative purposes, and on the assumption that project annual benefits and costs will continue to increase by at least the same rate as during the past 10 years, but excluding the impact of the NRA, we find that at the end of 10 years of deferral, annual benefits will have risen to \$49.2 million and costs to \$59.1 million thereby reducing the B/C ratio to .83. An exact approximation of the future B/C ratio can, of course, only be ascertained as a result of a complete B/C ratio analysis taken at the end of the deferral

period. The financial implications of deferral are reviewed in more detail in the section which follows.

The Financial Implications of Deferral

A significant impact of deferral relates to the cost of carrying the Corps current investment in TILP over 10 and 20 year deferral periods. The current investment of \$58,761,300 is broken down as follows:

Land and Damages	\$48,698,600
Clearing	19,400,000
Operation and Maintenance	166,700
Engineering and Design	8,834,700
Reimbursement from Penn-DOT for Route 209 Design	(53,900)
Project Administration	<u>1,095,800</u>
Total Project Investment	\$58,761,300

The Corps has \$58.8 million already invested in the project. If the project is deferred for 10 or 20 years, there will be a period during which there will be no return received from this investment. This return on investment lost through deferral of the project is best computed by compounding the Corps' cost of money for 10 and 20 year periods at variable interest rates of 3-1/8 percent, 5-7/8 percent and 7-1/2 percent. The resulting lost return on investment is as follows:

	<u>10 Years</u>	<u>20 Years</u>
3-1/8 percent	\$21,154,068	\$ 49,974,017
5-7/8 percent	\$45,246,201	\$125,298,888
7-1/2 percent	\$62,345,739	\$190,847,953

The amount thus computed is a measurement of the lost return on investment cost of deferring the project for 10 and 20 years. Thus the cost of carrying the TILP current investment at the end of a 10 year deferral period would approximate \$45 million when computed at the current federal government interest rate of 5-7/8 percent and \$125 million over a 20 year deferral period. These costs should logically be added to the total project costs when looking at the impact on the benefit cost ratio. Beyond this there are additional costs which should be considered. Taxes lost for the land already acquired for TILP amount to \$379,800 annually. The additional impact of these costs, assuming a constant tax rate, over 10 and 20 years respectively would be \$3,798,000 and \$7,596,000. In addition, the Corps of Engineers or the National Park Service would have an estimated minimum annual operating and maintenance costs of approximately \$50,000 that would further affect the total cost picture at the end of a specified deferral period by approximately \$500,000 for 10 years and \$1,000,000 for 20 years.

Should the project be deferred for 10 years or more a complete new economic analysis would then be justified to determine the project's current viability under current conditions. More specific impacts relating to secondary costs and benefits are outlined below and additional impact data can be drawn from Chapter XVI and XXII.

#### **XX.B.3. EFFECT ON FEDERAL INTERESTS**

Under a policy of deliberate deferral the role of the Corps and NPS would likely be defined by Congress. But, unlike the deauthorization of the dam itself, the interests of the Corps would likely remain since they would be involved in the ultimate construction of the dam should that occur. This would suggest the need for a working agreement between the Corps and the NPS since they would then have to be jointly involved in the operation of recreation lands and not merely the acquisition of the land as is now the case.

#### **XX.C. EFFECT ON DWGNRA**

The following is discussion of the impacts on DWGNRA, if TILP is deferred for a ten year period, during which it has been assumed that the park will officially be opened to the public with an initial development of facilities.

##### **XX.C.1. LAND ACQUISITION AND MAINTENANCE**

In order for DWGNRA to operate efficiently during the deferral period, it is assumed that additional lands will be acquired to consolidate the current patchwork quality of acquisition. Although no official determination has been made by the Park Service as to the amount of lands to be acquired, they have acknowledged that additional acquisition is necessary, which would at

a minimum, at least consolidate holdings south of Milford, and provide for the acquisition of the balance of the lake area properties. The question as to which federal agency, COE or NPS, would be responsible for obtaining the lands needed would have to be resolved.

The current uncertain status of the project, and the incomplete land acquisition has prevented the park from officially opening to the public. This uncertainty, a type of de facto deferral, is affecting the Park Service's ability to obtain the necessary operational funds to adequately maintain the lands and structures already acquired. NPS estimates that approximately one million dollars of deferred maintenance costs have already been incurred for the currently acquired lands and structures, and this will continue to increase each year for as long as the present situation continues.

#### XX.C.2. RELOCATION OF ROUTE 209

As some 14 miles of Pennsylvania Route 209 would be flooded if the lake were constructed, the COE has included the relocation of this highway as an obligation of the federal government in their plans. An extended period of deferral would leave the fate of this relocation proposal unresolved. Since Route 209 is already over-utilized and experiences heavy traffic volumes, especially during the summer months, the relocation and/or improvement of this highway could not await a decision on TILP through the deferral period. The position of the Park Service is that this highway must be

relocated in order to control access to the western portion of the recreation area, and that the existing alignment would be used for internal circulation. Therefore, it is assumed that the costs for this relocation cannot be deferred. A Pennsylvania DOT Study estimated the relocation and widening costs for a four-lane facility would be \$40 million. The Corps of Engineers estimated cost for Route 209 relocation as a part of TILP is \$31,550,000 for a two-lane facility. The facility should be built with or without TILP. If it was constructed during the deferral period then the cost of TILP would be reduced accordingly.

#### XX.C.3. FACILITIES TO BE PROVIDED

The "interim" nature of recreation facilities to be developed during the deferral period within the lake area would influence the commitment of whichever party is responsible for the development. Obviously, the focus of any intensive recreation activity would be along the riverbanks themselves and they would quite naturally be flooded were the dam eventually to be built. This would suggest less development of river facilities, which would be reflected in a lower patronage than the comparable deauthorization option. An alternative under which the COE merely maintains their lands in anticipation of eventual flooding and the Park Service develops recreation facilities only in the upland portions of the area, would severely reduce the patronage levels, compromise the Park Service's ability to provide a cohesive recreation area and perhaps present the COE with difficult

management and control problems.

The Clarke & Rapuano "Conceptual Master Plan" for DWGNRA, jointly sponsored by the Corps and NPS, does not consider the staging of the facilities and utilization of the recreation area under a deferral situation. Under the initial 4 million annual visitation phase of the Plan, over 60 percent of the facilities programmed relate to swimming and lake activities, and the only specific uplands facilities are 50 hike-in camping sites and parking for 100 cars. Even if all the upland facilities programmed for the 10.6 million visitor day final phase were constructed initially this would only provide for a design load of 10,600 persons or a little more than half of the 18,000 design load which is considered to be the threshold level for this Recreation Area, by the National Park Service.

Although the DWGNRA Master Plan is based on the facilities to be provided for a Recreation Area developed in conjunction with the lake, the plan could be modified to permit the staging of the facilities to fit a given deferral situation. However, patronage and total facilities developed will be considerably less than those which could be provided under one of the alternative Recreation Area plans for a river-oriented park as discussed in Chapter XVIII. With deferral, a greater reliance would have to be placed on the utilization of the existing roads and structures in the future lake area, to avoid undue expenditure for interim facilities.

As a final note on the impact of deferral, it can be assumed that once the lands are developed and operating as a Recreation Area, a large constituency for a river based Recreation Area will be formed. This constituency will no doubt resist change at the end of the deferral period, if in fact it were decided to proceed with construction of the dam.

#### XX.D. ECONOMIC AND SOCIAL IMPACTS

Impacts on the local community if the project were to be deferred would be virtually identical to the effect of developing the Recreation Area without a lake (until such time as the lake is built of course when the impacts would be those of the total authorized project). There are a few exceptions to this blanket statement, however. The uncertainty of whether a dam will eventually be built or not, would increase the speculative pressures on real estate in the area and perhaps encourage more commercial development than might have occurred with development of the recreation area only. On the other hand, the recreation visitation would build more slowly over time, and the communities might be in a better position to react to the impacts of the dam, if they were given a longer lead time and able to witness the actual impacts of the smaller number of visitors associated with river-based recreation.

Further, deferral will affect the local communities' ability to plan with any degree of precision for their future needs. There will need to be contingency plans based on each communities' individual

assessment of the outcome at the end of the deferral period. For some this will inhibit planning and development of areas which may eventually be required for highways to service the full project if the dam proceeds in the future. For others, development will occur which could inhibit future options. Currently, the project's uncertainty is effecting the local communities' ability to forecast their future needs for regional facilities such as hospitals, sewers, etc., and the future needs for public services (fire, police, highway maintenance). However, the majority of the local planning agencies have not seriously dealt with the implications of the project's development on their jurisdiction. The plans of local property owners could also be adversely effected by deferral.

Local (seven county area) impacts resulting from deferral can be described in terms of those social and economic opportunities foregone that would have resulted if the TILP project were constructed beginning immediately.

These can be summarized as follows:

Population	5,890
TILP Construction Payrolls (over an 8-year period)	\$30,000,000
TILP Construction Jobs (average annual for 8 years)	300-500
Annual Taxes Foregone (in 1974 dollars)	\$ 379,800

These and other impacts resulting from deferral can be drawn from the material presented in Chapters XVI, XVIII, and XXII.

## XX.E. ENVIRONMENTAL IMPACTS

In assessing the environmental impacts, the following assumptions have been made:

1. The DWGNRA will be in full operation. This will include development of all planned recreational facilities. This will also include the implementation of the WPC (Water Pollution Control) plan as defined in the TIRES Study.
2. Federal standards (P.L. 92-500) will be enforced as per present date interpretation. Therefore, the TIRES Area sanitation facilities will be up to secondary treatment level.
3. Engineering and construction costs will increase at the present rates, and
4. The project will be deferred for not less than 10 years and not more than 20 years.

### XX.E.1. ADDITIONAL COSTS

Standards have been proposed by the Environmental Protection Agency calling for an increase in the present level of treatment of both point and non-point discharge sources. The act is termed Public Law 92-500. The act

states as national goals the elimination of pollutant discharge to navi-gationable waters by 1985, prohibition of the discharge of toxic pollutants, and the instigation of a waste treatment management planning process to be developed and implemented to assure adequate control of sources of pollu-tants in each state. By this act, all existing treatment plants will be brought up to standards and all future treatment plants designed to include best possible treatment. Therefore, deferral of Tocks Island Lake Project will not be singularly responsible for an increase in treatment plants at future dates. That is, deferral alone will not be responsible for causing increased treatment costs. Any and all plants now existing in the TIRES Area or upstream reaches will experience an upgrading and therefore, increased cost by federal law with or without the dam.

However, the cost of materials will probably increase at levels of inflationary rates. Those portions of the treatment facility which serve as office space, maintenance facility, support of operation, protection, or work area (cost of land, easements, and sludge drying basins) will increase in cost. Those areas of the treatment plant dealing with the actual treatment process, cannot contribute additional costs to the process of deferral.

#### XX.E.2. DEFERRED COSTS

Construction costs due to environmental planning considerations appro-priate for the Tocks Island Lake Project will be subject to increases

because of project deferral. This includes brush clearing, the construction of sediment basins, the task of removing historic structures and archaeological remains from the area of inundation and replacing these articles in their designated areas, as well as the physical process of deterring storm and runoff waters from entering into the basin (new conduit and channels). The monitoring process of the water quality and overall environmental health will have to be continued within the basin. This will include contracts, reports, and surveys. The cost of the 880 acres of wildlife migration lands will increase. Increases will also be found within the area of fish ladder construction, and special environmental support planning constraints.

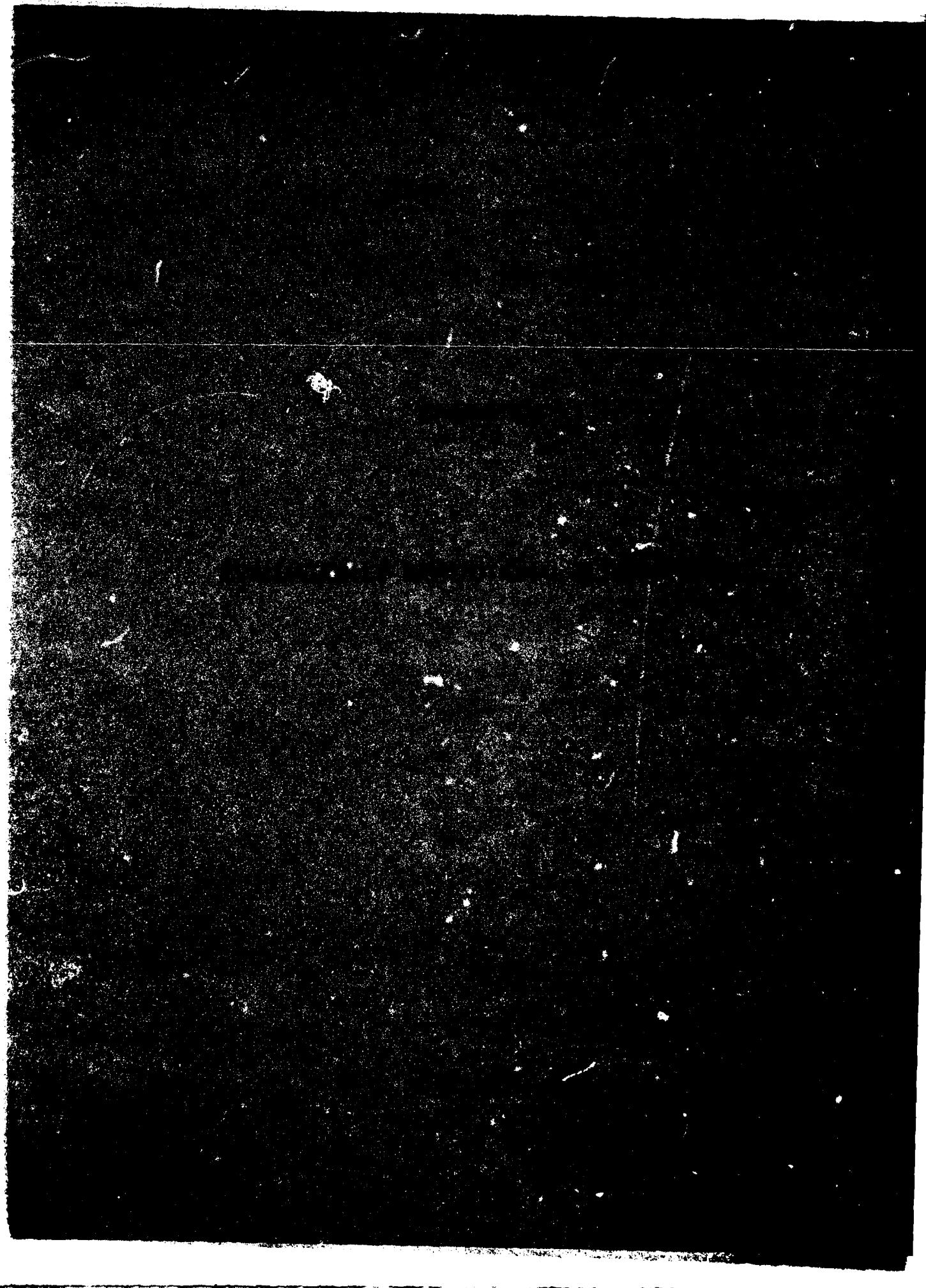
#### XX.E.3. DEFERRED BENEFITS

At present, the funds allocated under P.L. 92-500 have not yet been released to provide the necessary required sanitation treatment. Funds that do exist are under a great deal of competition for use. By 1985 funds needed for the upgrading of treatment plants will be available.

The technology of liquid waste processing is advancing at an accelerated rate. If the dam is deferred, technology may be available offering a decrease in treatment plant construction and operation costs. Also, disinfectants such as chlorine can be replaced by substances (ozone) thereby offering an effluent closer to ambient quality.

Implementation of non-point source control methods have yet to be perfected.

One of the purposes of Section 208 studies is to design non-point source control programs. If TILP were implemented on schedule, "208" program improvements designed for the upper Delaware River Basin to reduce non-point nutrient loads could be somewhat more costly and inefficient compared to future non-point control methodology.



The purpose of this chapter is to summarize and evaluate the institutional arrangements and constraints which are a consideration in the development of the Tocks Island Lake Project or its Alternatives. Obviously not all the institutional considerations can be presented. Included here are the primary existing governmental programs, regulations and policies, as well as the institutional linkages which have implications for the development of a major Delaware River Basin water resources and management project. Prior technical Chapters in Parts A, B and C discussed the institutional factors in determining future resource needs, the formulation and development of plans for TILP, and the evaluation of alternatives for each of the project's authorized purposes. The chapters in the preceding Parts relating to the individual functional areas should be referred to for the technical implications of the institutional programs presented here. The question of whether the state and local institutions will be capable of dealing with the future problems relating to these functional areas resulting from the development of TILP/DWGNRA is addressed in the Part E Chapters regarding secondary impacts.

The evaluation of the institutional arrangements and constraints in this Chapter is broken down into four sections. Section A summarizes the feasibility of the institutional alternatives discussed in Chapters XVII through XX; Section B reviews the institutional arrangements and constraints affecting the development of the Projects to satisfy the basin's need for flood control, water supply, recreation and power, or its alternatives. Section C looks at other institutional considerations which indirectly relate to the project development and its impacts, and Section D summarizes institutional linkages and the implementation of policy.

## **XXI.A. OVERALL FEASIBILITY OF FOREGOING INSTITUTIONAL ALTERNATIVES**

The previous four chapters (XVII-XX) have discussed and evaluated the major institutional alternatives to TILP which involve its potential deferral and deauthorization, the potential for reopening or altering the provisions of the Supreme Court Decree relating to water diversions and compensating releases, and finally alternatives to the Delaware Water Gap National Recreation Area which constitutes the major recreation component of TILP's authorized purposes. A preliminary summary of their feasibility follows, taken in the proper chapter sequence.

### **XXI.A.1 SUPREME COURT DECREE OF 1954**

The Court has shown repeatedly its preference for the resolution of interstate water disputes by voluntary compact between the affected states rather than through litigation. In the 1931 and 1954 Delaware River cases the Court placed specific diversion and compensating release requirements on the states, but left the door open for the parties to come back to the Court if circumstances changed which would warrant reconsideration.

The adoption of the Delaware River Basin Compact in 1961 effectively froze the provisions of the 1954 Court decree for 100 years, as the parties to the Compact explicitly waived their right to go back to the Court except in extremely

limited circumstances. The DRBC has authority under the Compact to alter the diversions and releases set forth in the 1954 decree, but only by unanimous consent of the four states involved and the City of New York in the absence of an emergency, and by unanimous consent of the four states and the United States in the case of an emergency.

As noted in Chapter XVII, the effect of the 1954 Supreme Court Decree was to define water diversions and releases based on optimum flow conditions. Even though there is no legal impediment preventing DRBC from adopting in advance a set of variable regulations relating to differing flow conditions for manipulating diversions and releases in the basin during an emergency, this has not been done. If the members of the Compact could unanimously consent to such a set of operating variables, a greater degree of assurance in being able to deal effectively with drought conditions and a greater degree of automaticity might be injected into the basin water resources management. In an appendix to Chapter III, an example of the use of a systems analysis method for determining varying water allocations during drought periods is presented. In that Chapter a logical basis is proposed for the equitable negotiations between water exporters (such as New York) and basin estuary water users (such as Philadelphia) by means of a gradual definition of a series of feasible negotiation positions. This type of approach allows each party to the Compact to consider its own benefits in terms of a mathematical optimization procedure, which is not possible under the rigid decision-making formula of the decree itself. If each of the parties to the decree could be convinced that its own needs for a high quality, adequate water supply could best be served by a series of flexible guidelines, the potential

for a future deadlock preventing DRBC from dealing effectively with emergency conditions could be avoided.

#### XXI.A.2 ALTERNATIVE NATIONAL RECREATION AREA PLANS

The National Park Service determined in its recent studies that a DWGNRA without TILP is a feasible alternative and that such a concept could meet Park Service goals and standards. With the completion of these recent studies, NPS will be equally prepared to develop DWGNRA with and without a lake.

The development of an alternative DWGNRA with a free-flowing river, like the recreation area with TILP, will be shaped by Park Service policy as discussed in Chapter XVI.E.2 and Chapter XVIII and as summarized below. DWGNRA should:

- 1) emphasize the recreational, natural and historic values of the area; 2) be developed for the primary purpose of outdoor recreation; 3) have a thematic design to realize the park's primary purpose noted in (1) above; 4) provide outdoor camping primarily for groups and give preference to public groups over semi-public and private groups; 5) provide overnight camping and hotel facilities for individuals if facilities in the surrounding area are inadequate; 6) encourage use of public transportation both between recreation nodes and to and from the park; 7) develop a mixed transportation system (vehicular and pedestrian) to provide maximum opportunity for visitor enjoyment and appreciation of the outdoor recreation experience.

The administrative and maintenance requirements would be somewhat different for

DWGNRA with and without a lake because of the different activity mix and scale of facility development. The extensive boating and swimming facilities and large "instant swimming and boating capacity" associated with TILP would require a larger and more complex administrative apparatus to maintain the environmental quality of the area and adequate emergency or other regulatory services. The Corps would have to develop procedures for managing the marinas, controlling the number of boats using the lake, solving the problems posed by drawdown and maintaining the water quality of the reservoir. The NPS would be responsible for keeping the visitation within the capacity of the park area dictated by the DRBC resolution either by permits, reservations or other visitor control techniques. The excessive demand for swimming and boating would require greater control mechanisms.

The current Park Service plans for a DWGNRA development without TILP are contingency plans if Congress should decide to deauthorize TILP. In such a case, Congress may address itself to the question as to the manner in which a DWGNRA without TILP might be fashioned. Should Congress then determine that a level of development not contemplated by current Park Service policy is desireable, it could easily so provide for in the legislation. This would naturally effect the above comparisons. However, in such a case, it is not anticipated that Congress would neglect the consensus of the basin states as contained in D.R.B.C. Resolution #73-6 limiting annual DWGNRA visitation to four million persons.

#### XXI.A.3 PROJECT DEAUTHORIZATION

Only the Congress can deauthorize the Project, and if it does it can logically be expected to explicitly address such questions as future use and/or dis-

position of Project lands, including lands acquired for the Delaware Water Gap National Recreation Area. If Congress were to deauthorize all of the project components, but not specify the future of the previously acquired lands, those lands would be disposed of in accordance with the Surplus Property Act, as amended, and applicable regulations.

As of April 30, 1975 approximately 97 million dollars have been invested by the Federal Government in land acquisition for both TILP and DWGNRA, resulting in the acquisition of 47,869 acres. Considering this investment, it seems unlikely that Congress would allow the future of the current federal lands to be decided by the routine workings of the Surplus Property Act. Also, if Congress were to deauthorize the dam and reservoir, it should at the same time address the question concerning the legal status of the DWGNRA and the pump storage facilities which were erected by subsequent "add-on" legislative authorizations. The Corps and the Park Service have expressed divergent views as to whether the deauthorization of TILP would also imply deauthorization of the recreation area. As this question is related to the disposal of lands acquired, it is unlikely that Congress would not address the future of DWGNRA in any deauthorization legislation. Since the Kittatinny Pump Storage Facility is dependent on the water impoundment created by TILP, its future development is probably more directly related to the Tocks Island Dam and Reservoir deauthorization decision.

#### XXI.A.4 PROJECT DEFERRAL

Explicit deferral by Congress would leave the lands under Corps (or Park Service) control and management. Congress would have to provide funds for

maintenance and "housekeeping." De facto deferral (i.e., Congress says nothing) would have much the same effect unless it continued for eight consecutive years with no appropriations, at which point automatic deauthorization could occur, pursuant to the provisions of S12(a) of P.L. 93-251. Automatic deauthorization would not occur under this law if either the House or Senate Public Works Committees acted affirmatively to block it or if the Secretary of the Army removed the project from the automatic deauthorization list within the prescribed time period.

The two institutional types of deferral described above, one by default and the other by explicit intent, would affect the ability of governmental agencies at all levels to effectively plan and implement other projects related to a Tocks Island decision. This situation would be analogous to that which currently exists with a few exceptions. If Congress were to adopt a policy of explicit deferral, it is likely that it would permit the Park Service to develop those portions of the recreation area which would not be inundated by a future water impoundment. Such a decision would necessitate a close working agreement between the Park Service and the Corps not only for the maintenance of the lands acquired, but for the recreation facilities to be constructed and their operation. Explicit deferral say for a period of 10 years, would also affect the plans of those agencies currently involved in the overall water management and resource development projects in the Basin, in particular the Corps and D.R.B.C. As Tocks Island is one of eight major reservoir developments in the Corps overall Delaware River Basin plan, its deferral for a definite period of time, would necessitate the re-staging and the partial modification of the other related projects. As D.R.B.C. has adopted the basic elements of the Corps plan, a deferral decision

on Tocks Island, which forms the "Keystone" of the D.R.B.C. Comprehensive plan, would require major revisions to its overall planning effort and a reorientation of its priorities based on the future uncertainty of TILP.

The related state and local agencies would also be affected by the degree of uncertainty caused by a deferral. New Jersey which has the greatest concern in meeting future water needs, would probably increase its overall State budget priorities for the construction of other water supply Reservoirs, and would most likely implement the major recommendations of the 1975 Musto Commission Report on Water Management including the development of a State Water Plan. In Pennsylvania, new impetus would be given to the passage of Senate Bill #1 providing for flood plain zoning similar to that enacted by New Jersey, and further measures to assure the protection of the Torresdale intake against salinity intrusion. A deferral decision would have a lesser impact on New York agencies and their long range plans, with the exception that the attention currently focused on the control of non-point sources of pollution in the upper basin because of a TILP, would be directed elsewhere. The least effect would be on the local governments in the Tocks Island Region, as the majority of their comprehensive plans are not contingent on a Tocks Island decision, with the exception of the relocation of Route 209 in Pennsylvania, and the economic viability of those Townships in the process of being fully acquired.

In the long run, the major institutional impact of deferral would be the implementation by all levels of government of contingency plans and policies which will no doubt establish a political climate by the end of the deferral period that would resist change, if in fact it were decided to proceed with the construction of the dam.

## **XXI.B. INSTITUTIONAL ARRANGEMENTS AND CONSTRAINTS RELATING TO THE PROJECT'S AUTHORIZED PURPOSES**

The institutional implications of the Tocks Island Lake Project (TILP) include both the responsibilities of governments and governmental agencies to take actions associated with the project as well as the impacts on these institutions of the project as proposed. In the various technical sections dealing with the resource needs (Part A) and in the discussion of alternatives to each of the project's authorized purposes (Part C) the various institutional regulations as they affect each of the functional areas were presented. In Chapter XVI, Section XVI.E.2, the institutional implications of alternative programs to the project were evaluated. Based on these preceding technical sections the institutional arrangements and constraints associated with the development of the project's authorized purposes for water supply, electric power generation, flood control, and recreation are summarized below, and the institutional impacts of the development of TILP are presented. This overview of institutional arrangements and constraints brings together the roles and responsibilities of governments and governmental agencies at the federal, state, regional, and local levels, and the inter-governmental linkages involved.

XXI.B.1 SUMMARY OF EXISTING INSTITUTIONAL ARRANGEMENTS AND CONSTRAINTS.

XXI.B.1(a) Water Supply

The principal water supply responsibilities of the Federal Government are set forth under the Safe Drinking Water Act of 1974. It places responsibility on the administrator of the U. S. Environmental Protection Agency (EPA) for promulgating drinking water regulations to protect the public health. EPA is responsible for determining maximum levels of water contaminates and required treatment techniques for each. This determination and set of recommendations will be the responsibilities of the National Academy of Sciences.

Another responsibility of the Federal Government is planning programs for improvements and extensions of water service. The Water Resources Council has a \$5 million planning program underway for the entire United States. A portion of these funds is being used for water planning purposes by the states within the Delaware River Basin. The principal federal water supply facilities construction loan and grant programs are administered by the Farmers Home Administration (FmHA) of the U. S. Department of Agriculture. This program is focused in rural communities having populations of less than 10,000. There is no federal water supply facility construction program for urban areas. State governments play the pivotal role in water supply facility planning, establishing standards and constructing facilities. Under the Safe Drinking Water Act of 1974, the states are responsible for adopting drinking water regulations, implementing procedures for their enforcement, maintaining

records of their work, issuing permits for water supplies and adopting and implementing water supply plans. The four states within the Delaware River Basin have located these water supply responsibilities within their respective department of environmental concern and health departments. In recent years, the four states have become more and more involved in water supply issues. Each of the states now carries on a water supply planning program, regulates the flow from water supplies, and enforces health standards.

Most water supply sources, distribution systems, and treatment facilities are the responsibility of municipal and county governments or private companies. Traditionally the local governments have been responsible for building and operating water supply facilities. Frequently they have done so at a profit. A number of water supply issues are being faced by local and state governments within the Delaware River Basin. These include adequacy of supply, proliferation of small systems, adequacy of financial resources to pay for systems and intergovernmental cooperation required for system implementation.

Urban areas within and near the Delaware River Basin which depend on the river for their water supplies, face the most difficult problems with respect to the adequacy of these supplies. The most severe problem may exist in the northern New Jersey area. It has been estimated by the state's Division of Water Resources that approximately 300 million gallons per day will be required to serve the area by the end of the century. The New York City and Philadelphia metropolitan conurbations also depend on the Delaware River for most of their supplies.

The proliferation of small water supply systems often reduces their financial and technical viability. Small water supply systems are often financially weak. Not only do most of the municipal and county governments in the basin have water supply systems, many private companies also provide this service. For example, in New Jersey, there are 225 private water companies throughout the state. A number of these are located within the basin area. These small systems may lack the financial base and management capability required to provide services necessary to meet contemporary standards and emergency needs. The proliferation of many small systems does not necessarily mean that their management function must be decentralized. A water system may have central management, and one or more water supply source and treatment facilities. Central management of several small water supply agencies can be an important factor in providing continuously reliable high-quality service. This is particularly true in rural areas where central management of multiple dispersed water supply agencies has the potential for upgrading the level of service of each.

Lack of intergovernmental coordination of water supply is an important stumbling block to improving the quality and efficiency of service. Delaware River Basin water courses-rivers, streams, creek and lakes-cross local and state boundaries. A reservoir may be located in one jurisdiction with distribution lines, treatment facilities and customers in other jurisdictions. The states of New York and New Jersey have both experienced resistance by residents to locating a reservoir within their jurisdiction to serve customers elsewhere. Interjurisdictional conflicts have proven to be one of the most

difficult decision points in the improvement of water supply systems in these states. As the states begin to play an even greater role in setting and enforcing water supply standards and sharing the costs of their construction, they may also be called upon to help solve interjurisdictional conflicts.

XXI.B.1(b) Power Generation

The Federal Power Commission plays the principal role in determining the location, amount and cost of electric power generation. Until recent years, little long-range planning for electric power has been done. Black-outs and brown-outs in communities within the basin have contributed to greater awareness of the need for long-range planning for this service.

The four basin states have experienced a variety of power generation institutional problems associated with independent approvals, permits and licenses required for construction of facilities. In some states, more than 20 individual approvals, permits and licenses are required before power can be generated and transmitted to customers. These cumbersome procedures can be even more complex in the basin states. The additional review procedures required by the Delaware River Basin Commission and the active participation of special interest groups deeply concerned with power generation problems, contribute to the complexity of project implementation.

New York and Pennsylvania are especially active in developing and implementing electric power generation policies. New York has one of the few state laws in the country regulating power plant siting. This regulation includes

evaluation of fuel alternatives, least cost planning and improvements in land use and environmental standards associated with power plant sites. Pennsylvania is testing the "energy park" concept. Prospective energy park sites have been located within the Delaware Basin in the state. Each would be 15 to 20 square miles and include several energy-producing facilities within its borders. These facilities would generate electricity using fossil fuels as well as nuclear fuels. Emerging critical areas associated with state regulation of power plants are nuclear safety, air pollution and regional growth. The states have a pivotal role to play in regulating each through issuance of permits and enforcement of regulations and standards.

The principal local government role in electric power generation is the use of land use controls to regulate the location of plants and development which they induce. Zoning controls, utility extensions and the provision of public services are all important ways local governments can influence the location, size and timing of electric power plant construction. Compared to electric utility companies, many local governments within the basin are ill-prepared to meet this challenge. Whereas it may require electric utility company expenditures of up to \$2 million to prepare and foster power plant siting applications, local governments may not have or choose to use zoning, utility extension policy or public services locations to influence where power plants are placed. Local government decision making is not always commensurate with the level of planning costs undertaken by the utility companies.

XXI.B.1(c) Flood Control

Structural and non-structural flood control programs are available to prevent or reduce flooding. An example of a structural flood control program is the construction of a dam or levee. An example of a non-structural solution is flood plain zoning. Both techniques have been used by communities in the Delaware River Basin. Federal Government solutions to flood control problems have most frequently been structural solutions in the past. The U. S. Army Corps of Engineers and Soil Conservation Service of the U. S. Department of Agriculture have been especially active in the planning of structural solutions to basin area flood control problems.

However, recent legislation and changing attitudes toward environmental preservation have increased attempts to use non-structural alternatives for controlling floods. The U. S. Department of Housing and Urban Development is responsible for administration of the flood insurance program. This program reduces the need for structural solutions to flood control problems because:

1. Program's requirements for land use planning and flood plain zoning reduce the number of building susceptible to flooding and therefore the flood damage reduction needs.
2. Governmental expenditures for rehabilitation of flood damaged areas are reduced to the extent that private flood insurance required under the program pays for the replacement of damaged buildings and equipment.

Many local governments within the basin have voted to participate in the HUD

flood insurance program. This participation requires them to regulate development within designated flood plains to comply with federal standards.

The state role in flood control includes planning, coordination, technical assistance, and partial funding of both studies and capital projects. In concert with local governments, the states participate in the structural solution of flood control problems in the following manner:

1. Detailed studies of the flood control problem and alternative solutions to it.
2. Identification of flood problems which can be reduced or solved through construction of flood control facilities.
3. Financial commitments of the local, state and federal governments to share in the capital costs and continuing maintenance of flood control projects.
4. Programming and authorization of capital funds for land acquisition, utility and building relocations as required and project construction.
5. Maintenance of the project following its construction.

When local governments undertake projects in connection with state or federal programs, it is the local responsibility to obtain all rights-of-way and easements, and provide for the removal or alteration of all public utilities. Costs for utility relocation are considered to be a part of total project costs. Physical structures located within a project area and requiring demolition and moving are also the responsibility of the local government. Funding can be obtained through state or federal government utilities relocation program funding.

The federal government presently contributes up to 20 percent of the cost for acquiring land, easements, rights-of-way, and relocations which would be required from non-federal interests as part of a non-structural method. The remaining 80 percent borne by state and local governments is shared with them based on formulae adopted by each state. Upon completion of a flood control project it is transferred over to the local government for operation and maintenance.

A number of issues have arisen regarding both the structural and non-structural approaches to flood control within communities in the basin. Often municipal governments are unable to raise local matching funds required to participate in flood control structural solutions. The infrequent and often temporary property destruction and relocation problems associated with flooding make it especially difficult for local governments to justify flood control expenditures within the context of tight budget constraints. Most flood control programs cross local or state boundaries. A flood control project in the headwaters of a water course may be located in one jurisdiction to reduce flood in other jurisdictions down stream. Removal of local matching fund requirements to the state level could help resolve the problem of local justification of flood control expenditures to assist residents of a different jurisdiction. States have been reluctant to program and implement flood control projects in the Tocks Island area because of the uncertainty of TILP. One of the principal uncertainties associated with the project is the definition of eligible costs. To the extent that Tocks Island Project eligible costs include local flood control project construction, states may become more willing to program and implement flood control projects in the Tocks Island area.

XXI.B.1(d) Recreation

Federal participation in recreation and open space land projects is focused on the National Park Service. It is responsible for the adoption and implementation of policies with respect to the designation of natural and historic areas and their subsequent use. There are four alternative designations for the land along the Delaware River upstream from the proposed Tocks Island Dam. They are: 1) National Recreation Area, 2) National Park, 3) Wild and Scenic River, or 4) Historic District. The U. S. Congress has designated land on either side of the Delaware River north of the dam as the Delaware Water Gap National Recreation Area. This designation encourages mass attendance by the public and active recreation services and facilities within the designated area. This includes man-made facilities providing for hiking, hunting, fishing, camping and other recreational activities. National Park Service policy calls for public overnight accommodations and services to be provided within local communities near the recreation area where possible. If the private sector response to visitor demand is inadequate, the National Park Service could provide overnight accomodations and services within the recreation area.

The federal government is not actively considering establishing either a National Park or a Wild and Scenic River at Tocks Island at this time. The principal implication of National Park designation is to preserve an area in its natural state. Wild and Scenic designation, which is being considered for the upper Delaware River, would preserve the river in its natural state without encouraging intensive use by the public. Since the criteria for Historic District designation are not met by the area along the river, it is unlikely

that it will be designated as such. However, it is possible that individual sites or buildings in the Tocks Island area will be designated Historic Structures in the future. Several sites, including the Old Mine Road, are being considered for formal designation as historic structures in the National Register.

The Corps of Engineers is responsible for land acquisition for both the proposed dam and the recreation area. In the absence of the recreation area, the Corps of Engineers could provide for recreation as part of the construction of the dam. This is not a Corps of Engineers' responsibility for the Tocks Island Project because of the National Recreation Area designation adjacent to and on either side of the proposed lake impoundment which is administered by the Park Service.

State governments are responsible for providing access to recreation areas developed by the National Park Service. The principal mode of access would be highways. Principal highway improvements would have to take place within New Jersey and Pennsylvania and require state participation in the funding of them. If the Tocks Island Project is implemented, it could have a spin-off effect on state parks and forests nearby. The attraction of the proposed lake and the Delaware Water Gap National Recreation Area could result in greater attendance at and use of nearby state parks and forests.

The Bureau of Outdoor Recreation, Department of the Interior, provides recreation development funds to states for acquiring or developing recreation facilities.

To be eligible, a state must prepare a comprehensive statewide outdoor recreation plan which complies with the purposes of the Outdoor Recreation Act. Continued assistance is predicated on periodic or continued updating. Financial assistance is provided on a project-by-project basis. Before any apportioned funds may be granted, the state must submit and secure approval of specific project proposals. The Bureau may approve only those project proposals submitted by the state. The Act provides that federal support shall be on a matching basis, to a maximum fifty percent of total project related allowable costs. Federal priorities for project funding conform to the general framework of priorities established by state plans.

Generally, priority is given to projects which meet urban needs, to activities of the general public over those for a limited group, to basic over elaborate facilities, to active over spectator type facilities, to projects not having other public or private funds available to them, and, where a scarcity of recreation lands exists, to acquisition over development. Projects which would enhance, preserve or restore natural beauty are encouraged.

Another role of the state governments is the regulation of hunting, fishing and boating within their borders. Each of these activities is licensed by each of the state governments. Enforcement of hunting, fishing and boating regulations would require increases in state personnel responsible for doing so. Within federal facilities, however, regulations can be enforced by federal personnel.

The principal role of local governments is associated with managing or mitigating the secondary impacts of tourists attracted by recreation opportunities through zoning and other land use controls.

#### XXI.B.2 TILP/DWGNRA-INSTITUTIONAL IMPACTS

##### XXI.B.2(a) Federal Institutional Impacts

The construction of TILP and DWGNRA will have a major impact in increasing the responsibilities and influence of the federal agencies involved over related projects and local institutional policies in the Region. The Park Service, as the agency responsible for the management and operation of the DWGNRA, may exert a greater influence over the development patterns beyond its project boundaries and the integration of local infra-structure improvements with its own facilities development. The Corps, as the agency responsible for the Dam and Reservoir operations, will also have a greater influence over other basin projects and policies which would affect their Reservoir operations.

The federal government's role in water supply is principally carried out by the Environmental Protection Agency, Farmers' Home Administration and Soil Conservation Service. Construction of TILP would provide a water supply reservoir which would have to meet standards established by the "Safe Drinking Water Act of 1974" administered by EPA. The FmHA provides loans and grants to communities and to individuals. Since development and expansion of water

systems is primarily a function of the need for such systems and the federal institutional capacity exists in EPA, FmHA and SCS to administer and fund their programs, no major federal water supply agency institutional impacts will occur attributable to construction of TILP.

There are two principal federal agencies, in addition to the Corps having responsibility for flood control projects. The SCS builds flood prevention structures in rural areas. The Department of Housing and Urban Development administers the National Flood Insurance Program. Construction of TILP would alter the need for and priority of SCS flood prevention structures on small streams within the Delaware River Basin. The need for flood insurance and eligibility of communities to participate in the program would likewise be altered by construction of TILP. The flood plain upstream from the dam would be acquired for public purposes for the length of the reservoir. The flood plain downstream from the dam would be altered based on the dam's operation. The result would be changes in the location and amount of land comprising the flood plains of the Delaware River and its flood tributaries. However, no changes would be required by SCS or HUD in their flood control programs if TILP was constructed.

Federal participation in recreation projects is focused on the National Park Service. Construction of DWGNRA would require expansion of the NPS budget and an increase in personnel to manage the NRA. No changes in current NPS policies or procedures would be required. Interagency cooperation between NPA and federal, state and local agencies responsible for the construction or control of

transportation, public services and public utilities used by park visitors would be required.

There are three federal agencies having power generation regulatory roles: the Federal Power Commission, Nuclear Regulator Commission and Environmental Protection Agency. FPC regulates private utility companies. NRC regulates the construction and operation of nuclear power plants. EPA issues permits for construction of power plants which are required to meet federal air and water quality standards. Construction of TILP would require the proposed power generation facilities to meet federal standards and obtain necessary permits without affecting the agencies responsible for administering those standards or issuing those permits.

#### XXI.B.2(b) State Institutional Impacts

A summary of impacts on the water supply, flood control, recreation and power generation institutions at the state level is given below.

State water supply institutions are responsible for promulgating water supply standards, equal to or more restrictive than those in the "Safe Drinking Water Act of 1974". They are also responsible for assisting communities to provide matching funds for FmHA projects. New Jersey also owns and operates water supply reservoirs. Construction of TILP would affect the planning, programming and budgeting by state agencies for water supply projects. To the extent that the availability of TILP reservoir water alters the need for other sources of water in each state, those states may have to increase or decrease their water supply planning, programming and budgeting functions. The creation of the Tocks

Island Lake for water supply will establish an alternative source of water in New Jersey and Pennsylvania and would decrease the importance of other projects that would be required if TILP was not constructed.

Flood control responsibilities of state governments are focused on permitting local governments to implement non-structural solutions and assisting in the financing of structural solutions. If TILP is constructed, state priorities for structural and non-structural flood control measures must be modified to reflect the new flood hazard boundaries. Therefore, state flood control plans will be changed to respond to TILP if it is built. These changes will not represent major institutional shifts but may require revision of expenditure and project priorities in the states' other river basins.

State recreation facilities near DWGNRA would have more demands placed on them by visitors coming into the area whose primary destination is DWGNRA. State park and recreation institutional responses will include additional investment in land acquisition and program development for state parks near DWGNRA in New Jersey and Pennsylvania. Additional funding and personnel will be required to operate expanded state park and recreation programs if TILP or DWGNRA is built.

State involvement in power generation is through respective public utility commissions and environmental conservation agencies. Public utility commissions regulate private utility rates in a manner comparable to the Federal Power Commission. Construction of TILP would require public utility commission review

and evaluation of the rate structures for the hydroelectric and pumped storage components of the project. In New York the public utility commission is responsible for administration of the state's power plant siting law. State environmental agencies administer the state air and water quality laws and would be required to evaluate these aspects of proposed electric power generating facilities. Construction of TILP would not result in any major impacts on state institutions responsible for administering power generation regulations.

XXI.B.2(c) Local Institutional Impacts

A summary of the kinds of impacts on the water supply, flood control, recreation and power generation institutions at the local level is given below.

The four principal types of water supply institutions at the local level are municipal, county, special purpose authorities and private companies. Each would have the opportunity to purchase water from the TILP reservoir for local consumption in accordance with allocations established by the 1954 U. S. Supreme Court decree. No new water supply institution would be required to expand local water service. However, some areas may want to establish or expand municipal water systems to take advantage of additional water. Creation of a regional or subregional supply system could be realized by removal of institutional barriers as discussed in Chapter XXII.

Local institutional responses to the flood control aspects of TILP will be required by townships located both upstream and downstream from the proposed dam. The flood plain along the reservoir will be stabilized, predictable and

in public ownership. No changes will occur in existing flood plains along the tributaries. The flood plains located in downstream townships will be reduced in size and depend on the flood control operations of the dam. Therefore, construction of TILP will reduce institutional responses required of local governments within whose borders the project changes the location or size of the flood plain. Less flood plain zoning, flood proofing laws and building construction restrictions will be required with TILP.

Recreation responses by local governments due to the construction of TILP would largely be in the form of providing services to DWGNRA visitors. The types of responses that may be required include extending basic infrastructure services to private recreation and recreation-related facilities. This could represent an institutional and financial burden to localities if they do not receive sufficient taxes to cover capital facility investment and additional staffing needs.

In general, local institutions are not responsible for regulation or review and evaluation of power generation facilities. Construction of those facilities as part of TILP would directly impact Blairstown Township, New Jersey, where the Kittatinny Mountain pumped storage facilities would be located and localities where power generation transmission line rights-of-way would be located. In these cases a principal institutional impact would be the regulation of land near that taken for power generation purposes and the increase in the tax base.

## XXI.C. EVALUATION OF OTHER INSTITUTIONAL CONSTRAINTS

Other institutional constraints related to the impacts of the project's development or its alternatives are presented below. These include the institutional arrangement and constraints affecting the maintenance of water quality standards, the regulation of water and electricity pricing patterns, provision for public transportation to DWGNRA, and the implementation of land use controls.

### XXI.C.I WATER QUALITY

The Federal Government plays an important role in the funding of waste-water quality planning management and construction of facilities. In 1972, the U. S. Congress passed the Federal Water Pollution Control Act Amendments which form the basis for ameliorating water quality problems within the Delaware River Basin and elsewhere in the country. This landmark legislation identified urban/industrial discharges as the principal water quality problem. The Act requires each state to establish a continuing planning process for each drainage basin within its borders. States are responsible for establishing effluent limitations and schedules of compliance with these standards, overseeing inter-governmental cooperation in meeting wastewater quality management problems, programming for the implementation of water quality standards and establishing priorities of needs for construction of waste-treatment works required to meet adopted standards. (A further discussion of the implications of the PL92-500 Regulations is presented in Chapters VI and IX.)

Section 208 of the Act requires metropolitan areas to plan and manage a comprehensive wastewater program including a coordinated planning and management system for municipal and industrial wastewater, storm and combined sewer runoff, non-point source pollutants and land use. The adopted planning and management process is expected to focus on an integrated approach for identifying and controlling the most serious water pollution problems and implementing solutions to them. The Act also provides for federal grants in support of sewer collection systems and wastewater treatment works. These grants must conform to previously prepared wastewater quality management plans. The framework for Section 208 work is the basinwide overview of the impact of the pollution sources and alternative control measures. Detailed project planning is accomplished under Section 201 of the Act. EPA is responsible for administering the Federal Water Pollution Control Act Amendments of 1972. Rural water quality planning and system construction is supported by FHA in communities having populations of less than 10,000 people.

Delaware River Basin states are principally responsible for the location, size of facilities and timing of construction of wastewater treatment plants. States control these decisions through the planning process as promulgated by EPA and through wastewater system permits required of local governments, private companies and individuals. The Delaware River Basin Commission reviews wastewater quality facility investments which may influence the quality of water within the basin. However, the states play the most critical role in wastewater quality management through allocation and matching of EPA funds for facility construction and setting priorities. Sub-state areawide wastewater treatment planning processes are underway in the basin states.

Generally the states establish funding priorities according to the severity of the pollution problems. To insure statewide consistency, planning study specifications are developed by the states and implemented by areawide and local governments. These studies identify the actions and policies that are required to achieve and maintain surface and ground water quality in a manner that is economically sound and consistent with state and local environmental objectives. Wastewater treatment facilities also play an important role in implementing state and local development objectives. To the extent that contemporary standards are enforced, urban and suburban development requires connections to wastewater treatment facilities. Their presence can have an important affect in guiding development to locations predetermined through the comprehensive planning process.

Almost all local governments either directly or through a special-purpose authority provide some form of wastewater management service. Some provide all of the conventional services of collection, conveyance, treatment and disposal while others limit themselves to providing only partial services and contract with other governments or private companies for the remainder. In some rural areas, sewer service activity may be exclusively limited to the regulation of on-lot disposal systems and review of private wastewater treatment proposals. When wastewater problems arise, they most directly impact local governments and their residents.

A plethora of wastewater quality issues have arisen in recent years throughout the Delaware River Basin. Following the establishment of standards by state governments in conformance with federal legislation, it became necessary to develop programs for meeting these standards. One of the most critical deficiencies

has been the lack of funding to build facilities which meet the water quality standards imposed. As the cost of facility construction has increased, the ability to finance it through previously authorized sewer treatment programs has been reduced. Often municipalities have had difficulty raising sufficient funds to match federal and state authorizations.

Other wastewater quality issues include inequitable payment schedules, inadequate treatment capacity and intergovernmental cooperation. It is not unusual for persons living in neighboring municipalities or even in the same municipality to pay different sewer use charges even though they utilize the same basic conveyance and treatment facilities. In some cases, a wastewater system cannot serve newly developing areas or is inadequate to serve the special needs of local industry. This may have been caused by inadequacies in the initial design and construction of facilities in order to save money. Such quantitative and qualitative shortcuts are often difficult to remedy. Because wastewater treatment facilities follow drainage basin boundaries rather than local jurisdictional boundaries, intergovernmental cooperation is a key to successful solution of pollution problems. Downstream treatment plant locations to serve upstream development in another jurisdiction is frequently unpopular in the downstream jurisdiction. At the same time, federal and state standards often urge sub-basin areawide treatment which requires inner-jurisdictional use of common facilities.

Delaware River Basin municipalities often have the added burden of planning wastewater treatment capacity for both permanent and seasonal residents. It is inefficient to provide service to seasonal residents who use the service

infrequently during the year. Yet, if facility design is based on the number and location of permanent residents, treatment capacity will be inadequate during peak population periods. The inadequacy of treatment facilities has resulted in a number of local building construction moratoria. These moratoria have often meant deferring development until environmental standards can be met. At the same time, the proliferation of many small wastewater treatment systems has proven inefficient in terms of their financial, management and operating viability. Insufficient funding, costly management overhead and the lack of trained operating technicians often result in lowering the quality of service while increasing its unit cost.

The assimilation of wastewater by the Delaware River is a continuing issue of substantial magnitude. The uncertainty of the Tocks Island Lake proposal has clouded the planning and construction priority-setting processes according to the Office of Resources Management, Department of Environmental Resources, Commonwealth of Pennsylvania. River flows at wastewater treatment works discharge points influence the amount of wastewater which can be discharged if statewide standards are to be met. Fluctuations in the flow of the river introduce an uncertain variable into the wastewater assimilation equation.

## **XXI.C.2 INSTITUTIONAL ARRANGEMENTS REQUIRED TO ALTER PRICING PATTERNS**

The purpose of this section is to analyze the institutional controls affecting pricing patterns of electric power and water and the use of pricing policy to influence demand. The analysis of pricing patterns will only be from an institutional perspective; that is: how do government agencies -- federal, state, local -- impact on the derivation of the set of prices paid by the consumer for the services of electricity and water.

This section is to be divided into two major categories -- electric power and water supply. Under each of the categories there will be a discussion of the institutional impacts on pricing patterns by level of government.

### **XXI.C.2(a) Electric Power**

**Federal Institutions.** There are principally two federal agencies that affect the price of electric power to the consumer: the Federal Power Commission (FPC) and the Rural Electrification Administration (REA). The FPC regulates the rates of public utilities selling electricity in interstate commerce at the wholesale level. It does not regulate retail power rates. The FPC requires very detailed information from the utility companies in order to make its judgments on the setting of rates. Every public utility engaged in interstate commerce must submit to the Commission complete rate schedules which specify all rates and charges for any transmission or sale of electric energy, and the regulations affecting such rates. No public utility can charge any other rate than that which is on file with the Commission.

To determine a change in rate schedule the Federal Power Commission reviews a series of documents that each public utility is required to submit. The following required material is the basis for the decision making of the FPC:

1. A statement comparing the sales and services of the old schedule with the proposed new one, and the revenues derived from the different rates.
2. A comparison of the proposed rate with other rates of comparable public utilities.
3. Statements including the following items: balance sheets, income, earned surplus, cost of plant, accumulated depreciation, average working capital, operating expenses, depreciation expense, taxes, and over-all cost of service.
4. A statement which gives the details on how the rate of return is established.

The Rural Electrification Administration (REA) of the Department of Agriculture provides 2 percent interest loans for a period not to exceed thirty-five years to public utilities in rural areas. Because much of the electric power service area of the Tocks Island Lake Project is rural, the REA potential for providing low cost loans is significant. One of the principal components in establishing rates is the cost of the electric generating plants; and if this cost is lowered by relatively inexpensive money, the cost of the plant should be lower and in turn this should lower the rates for electric power. The REA program is not, however, large enough to have a significant impact on the rates throughout the service area.

State and Local Institutions. At the state level the most significant agency that affects the pricing pattern of electric power is the public utility

commission. In addition, the state's power of taxation will influence the pricing pattern. In the discussion which follows each state will be treated separately with respect to its pricing pattern institutions.

The Pennsylvania Public Utility Commission is a quasi-judicial agency of the Legislature with the primary duty to regulate the intrastate rates and service of public utilities operating in the Commonwealth. Its chief objective is to establish and maintain reasonable rates and adequate service.

The Commission has jurisdiction to ascertain fair and reasonable rates and pending a final determination in rate proceedings, may provide for temporary rates. It has the discretionary authority to suspend proposed rate increases for nine months if preliminary studies indicate the rates may produce excessive returns. Investigations and public hearings are held to determine justification of suspended rate increases.

The Commission has the right in rate adjudications, to examine the physical property of utilities and police their books and accounts. It may prescribe tariffs under which rates may be collected, determine refunds to customers where excessive charges have been made, and act to eliminate discrimination in rates. In addition, utilities cannot legally charge rates other than those officially on file with the Commission.

A factor in the Commission's analysis of the public utilities is taxation. Pennsylvania imposes a Utility Gross Receipts Tax on the gross receipts from business transacted within the state by public utilities. The rate is

forty-five mils for all utilities. There is also a state tax on the real property of utilities which is levied at a rate of thirty mils on the State Taxable Value of utility realty. The State Taxable Value is defined as the cost of utility realty, less reserves for depreciation or depletion as shown by the accounting books of the utility. An additional realty tax is levied by the municipalities on the real property of utilities.

The Public Service Commission of New York establishes all of the rates for utilities. The law further states that the rates must (1) cover all the utility's legitimate expenses in providing safe and adequate service, and (2) provide an overall rate of return sufficient to pay interest on its debts, compensate stockholders fairly and attract new capital at reasonable rates.

The process of rate making takes two forms: (1) interim rates, which are permitted only when necessary in the public interest, or to permit the utility to continue to provide safe and adequate service, or to preserve the financial integrity of the company; (2) permanent rates, which must be based on the overall financial needs of the utility, including its legitimate expenses and a fair return on its net investment.

The Commission generally has emphasized one criterion for interim rates: whether the utility's interest coverage was too low to accommodate necessary debt issues.

In contrast to the limited scope of an interim rate case, an investigation of a company's claim for a permanent rate increase examines all aspects of its financial operations: revenues, expenses, rate base, capital structure, and the proper design of rates to produce the needed revenues.

The law requires hearings on all major proposals -- for a 2.5 percent of the utility's revenues or \$100,000, whichever is larger.

New York State imposes no utility tax per se. It does, however, have a four percent sales tax which is applied to the electric bill of the consumer.

Local jurisdictions in New York apply a local property tax on all public utilities. Municipalities may impose up to a four percent additional sales tax on the state's tax; they have the option of applying a one percent tax on the gross revenues of utility companies. In the latter situation, of the 557 villages eligible to impose the one percent tax, 263 had availed themselves in 1972 of this additional source of income.

The objectives of the New Jersey Department of Public Utilities are to insure that utility services are provided at reasonable, nondiscriminatory rates to all members of the public who desire such service and that the essential utility and energy services are provided to the public without disruption in a safe and efficient manner.

The Department makes rules, regulations and administrative orders for the regulation of rates. These regulations include, although not limited to, requirements that all utility books and records be kept in accordance with the Department's prescribed uniform system of accounts, that all utilities submit for review and audit quarterly and annual financial statements and reports, that no indebtedness or divestment of property be undertaken without prior approval, that all terms and rates for service be both initially approved and subject to the requirements of the Department, and that revenues of the utilities be no more than sufficient to cover allowable expenses and provide a rate of return to the investors as determined by the Department. The Board of Public Utility Commissioners held the rate of return at or below eight percent in almost all cases as stated in their 1972 Annual Report for the years 1970 through 1972.

There are two state public utility taxes: the Public Utility Gross Receipts Tax is in lieu of local taxes and is applied at a rate of 7.5 percent to the gross receipts. The tax is apportioned to the taxing districts for local collection but a portion is paid to the State. The state receives a portion to compensate it for expenses incurred in assessing and apportioning the tax. The other tax is the Public Utility Excise Tax which is an additional tax on the gross receipts of public utilities. For electric power companies the rate is 0.9375 percent and the tax is for state use. Municipalities impose a real property tax on public utilities.

XXI.C.2 (b) Water Supply

Federal Institutions. Because the federal role in water supply price setting is so indirect and insignificant, it has been possible to only identify two federal agencies that could have a possible effect on the pricing pattern of water supply. The first federal agency is the Farmers Home Administration of the Department of Agriculture, which provides loans and grants for the development, storage and distribution of water. The loans are made at below market rates of interest and cover up to 100 percent of project costs. Grants may be made for up to 50 percent of project development costs. Eligibility is available to communities with a population of less than 10,000 people with the highest priority given to applications from rural communities with less than 5,000 people.

The second federal agency with any effect on pricing patterns of water supply is the Soil Conservation Service of the Department of Agriculture which advances funds to develop water supply for municipal or individual use. These grants reach a maximum of 30 percent of the cost of a multiple purpose reservoir and defers payment for a maximum of 10 years without interest.

In both cases the price of water will be affected by the cheaper availability of capital funds than would be the case if the funds had to be raised in the private market. These lower interest rates will in turn lower the development costs of the project and thereby lower the rate charged for the water.

Whenever a project may have a significant impact on the water resources of the Delaware Basin, it must be submitted to the Delaware River Basin Commission

(DRBC) to determine its effect. Except in the following situation the DRBC will be responsible for reviewing all water supply projects impacts in the Basin:

1. The construction or removal of impoundments when the storage capacity is less than 100 million gallons; and
2. A withdrawal from ground water impoundments or running streams as long as the daily average gross withdrawal during any month does not exceed 100,000 gallons.

State and Local Institutions. The state governments often play an important regulatory function with water supply through their public utility commission. However, because most water supply systems are of a localized nature, the municipalities play by far the most important role. A brief discussion of the limited roles of the states public utility commission is discussed below. Since in the preceding analysis of electric power the role of public utility commissions in rate setting was fully discussed, it will not be necessary to repeat how rates are set.

The Pennsylvania Public Utility Commission plays no role in water supply rate fixing. Under the provision of the "Municipality Authorities Act of 1945", Pennsylvania municipalities are granted the right to form authorities to provide water services within their jurisdictions. Authorities can fix, alter, charge and collect rates and other charges in the area served by their facilities at reasonable and uniform rates to be determined exclusively by it. It also has the right to borrow money, make and issue negotiable notes, bonds and to secure the payment of such bonds by pledge of revenues and receipts.

The New York Public Service Commission role in water supply rate setting is applied only to privately held companies. The setting of rates for these companies goes through the same process as the previously mentioned electric power utilities.

Municipal water authorities in New York as public benefit corporations are created by a special act of the state legislature for a specific water supply activity. A water authority depends on revenues raised by water charges and this revenue base is fundamental to the authority's operation: the authorities capital must be borrowed and secured only by the revenue of the system.

The private water companies are significantly affected by the sharply increasing local tax rates and assessments in New York. The Commission took action in 1973 to mitigate the effects of rising local property taxes on the water companies' earnings by instituting a tax adjustment clause which acts to rapidly recover unavoidable expenses.

Water rates are regulated by the New Jersey State Public Utilities Commission if the water is sold by a private water company or a public water agency that sells its water to retail customers outside of its boundaries. Only Morristown and Trenton have regulated municipal water agencies.

Many New Jersey Municipalities provide their own water supply. Generally, municipalities can construct and operate their own water facilities, they may purchase, lease or acquire by condemnation any water facilities, it may issue bonds to finance acquisition or construction, and it may transfer surplus revenues to the general municipal treasury, which is the common practice after paying interest and operating costs.

There are presently 225 private water companies in New Jersey. Powers of these private companies are comparable to those of municipalities, including condemnation. The Public Utility Commission regulates the quality of service provided by all private water companies.

#### XXI.C.2(c) Conclusion

The institutional controls over the pricing patterns of electric power and water supply vary significantly by level of government and by the type of utility. Electric power rates to the consumer are indirectly influenced by the federal government, primarily through the Federal Power Commission, and directly influenced by the different states' public utility commissions. In contrast to water supply system there are few publicly owned electric power plants.

Water supply rate control is very different from electric power. Public utility commissions in New York and New Jersey have some impact, mostly over the private water supply system. The municipally owned systems are far more numerous and important; however, their only rate control is that which they impose upon themselves.

Rising property and utility taxes have an impact on the cost of the utility service. The public utility commissions take this factor into consideration when they consider increasing a rate.

As discussed in Section XII.B.8, the modification of pricing patterns would only have a limited effect on overall water demand and consumption. With respect to residential demand, water used for sprinkling and possibly air conditioning, may be price-elastic; however, it is unlikely that capitalizing on the presence of that price elasticity is likely to be very meaningful in the long run to manage total water demand. With respect to industrial demand, it appears that price policy could potentially influence such demand and currently represents the most promising of the price policy prospects for overall management and control of region-wide water demand. The beneficial implications of this are substantially diminished by the fact that the large water using industries are largely self-supplied and, in all likelihood, will continue to remain largely self-supplied. The potential effects of price modifications on publicly supplied industrial water consumption is also limited.

Because the alteration of pricing patterns has only limited potential with respect to the reduction of the demand for overall publicly supplied water, institutional arrangements to achieve these limited reductions are not considered to be significant constraints. Further, as noted in Section XXI.B.8, the reduction in demand for publicly supplied water is not considered to be in itself a viable alternative to the Tocks Island Lake Project.

### XXI.C.3 Institutional Factors of Mass Transportation

Several institutional factors must be taken into consideration in selecting and implementing mass transit systems. This section discusses the following three factors that have characterized public transit and must be accommodated when implementing and operating a transit system: The personnel, operations, and the political nature of transit. Also discussed are some of the current policies and changing conditions which will affect development of mass transit in the future.

Transit personnel are divided into labor and management. Transit is a labor intensive industry with labor costs comprising about 80 percent of total operating costs. Transit employees are unionized and have enormous powers to bargain for better wages and benefits, and to control major elements of operation such as schedules and working hours. Managers of privately owned transit systems tend to be very cost conscious because of their orientation toward profit. Managers of publicly owned transit systems tend to be service oriented because of the direct public support their operations usually receive. Private managers are not indifferent to service nor are public managers unconcerned with costs, but the patterns of their respective managerial philosophies display a different emphasis.

Transit systems have operating characteristics that are perceived by users very differently from the private car. The average American often views mass transit as inappropriate or unsatisfactory for long recreation oriented trips from population centers to such areas as Tocks Island. Major dissatisfactions often stem from the level of comfort and quality of service, door to door trip time, the need to transfer between vehicles and systems, the inconvenience

regarding baggage, the perception of large out-of-pocket expenses in comparison to an automobile (especially for a family) and the inflexibility of the route and schedule. A transit trip must be carefully planned, and variances of itenerary can mean long delays.

Transit systems depend upon political agencies for their existence. Route franchises, fare structures, and subsidies for capital and operating expenses are often influenced or actually determined by elected officials and political trends. Currently, there are limited Federal monies available for operating expenses on a 50-50 federal-local basis, and funding for capital costs on an 80-20 federal-local basis. In addition, most local governments provide additional subsidies for local operations. Strong governmental control of transit operations occurs through such agencies as the Interstate Commerce Commission, the Urban Mass Transportation Administration, and State Departments of Transportation.

The largest influence on transit system development and service is political. This often reflects the low level acceptance of transit. This attitude occurs primarily in medium size cities and suburban areas where a great number of prejudices against transit exist, ranging from parochial neighborhood objections to safety. These must all be reckoned within a politically feasible manner. Even individuals who extol the use and value of mass transportation are often found to utilize their own automobiles exclusively.

The current economic recession, a diminishing supply of energy, rising fuel costs and the growing concern with environmental quality have motivated the increase in federal and state support of mass transit systems. Recent budget appropriations show a definite shift in emphasis from highway development to the research and development of public transit. Growing efforts to improve the service capabilities of existing systems and hardware, indicate the new concerns for mass transit improvement. The current limited acceptance and real demand for mass transit, that has characterized a public used to the convenience of private automobiles, can be expected to change as the cost of fuel increases.

Within the next decade, the demand for increased public transportation to a national recreation area such as DWGNRA from the major urban centers can be expected to grow. A well-publicized, imaginative design, for recreation oriented transit would succeed for DWGNRA if all the preceding constraints and problems are recognized and dealt with.

#### XXI.C.4 INSTITUTIONAL ARRANGEMENTS AFFECTING LAND USE CONTROLS

The ability to properly manage many of the secondary growth impacts on the surrounding communities of any of the various DWGNRA alternatives, TILP, or any of it's project alternatives is largely dependent on the

land use control powers available and utilized at various levels of government. The following discussion of these powers identifies the jurisdictions where these various powers lie and evaluates both the financial and political feasibility of actually utilizing them.

As the seven county primary impact area of TILP/DWGNRA Project includes three states, one is immediately confronted with the differing control mechanisms existing at the same levels of government and the resultant difficulties of coordinating policies and programs on a regional basis - a necessary prerequisite for minimizing sizable growth impacts. This condition of different state approaches is primarily due to an inadequate Federal Land Use Act. This situation may be improved with the proposed federal land use legislation, currently under consideration in Congress. (Congressman Udall's Bill H.R. 10294.) This bill, which includes many of the American Law Institute's Model Land and Development Code provisions, would compel state governments to provide an overall land use framework and land use policy standards.

As of the present, state land use powers among New York, New Jersey and Pennsylvania vary widely and hence are a major constraint to an adequate three state regional approach to land use planning in the impact area. A brief summary of these state powers follows for each of the above.

For New York State, the major powers are in major land subdivision approvals and sewage treatment controls. Any development over four lots is considered a major subdivision and any development over 49 units has to provide a central

sewer system. In some sophisticated townships such as Greenville, New York, the phasing of subdivisions expressly to avoid this regulation is forbidden. In these cases, sewage treatment levels are certified by state and county health departments including the testing for adequate soil percolation rates and specifying standards for septic tanks.

New Jersey has no overall land use act requiring the adoption of master plans and controls although recent attempts have been made at passing legislation, and at present, a revised bill is under consideration. Adopted legislation includes the Realty Improvement Act requiring state approval of major subdivisions (however, defined as 50 lots or over); a Farms Land Assessment Bill which has been only mildly effective; and a Flood Plain Zoning Act. The Realty Improvement Act is commonly avoided by phasing developments in 49 unit or less increments. Other state powers regulate the quality of sewage effluent and the location of landfill sites, and sewage treatment plants (under the State Department of Environmental Protection).

Pennsylvania's state powers tend to be more restrictive than New Jersey in the areas of sewage collection and treatment but perhaps less so in land use control. The State is, however, developing a State-wide land use policy plan to be completed this summer in which land classifications will be determined in coordination with the COWAMP results and flood plain land uses. Until the plan is enacted, state land use controls will not be available. The Sewage Facilities Act of 1967 requires all municipalities and/or counties to prepare sewage facilities plans for approval. Upon adoption, all following permits for sewage facility installations including septic tanks issued by the county

or municipality must be in accord with the adopted plan. State Department of Environmental Resources' approval is required for any project which is either a supplement or revision to the county or municipality's official plan. The state has control over solid waste disposal but minimal controls over water systems (location of wells under the Sewage Facilities Act and permits for central water systems from the Pennsylvania Utilities Commission except for water associations which do not require permits).

The county powers in all three states lie generally in their ability to provide services (from highway construction and maintenance to administration of state and federal welfare and unemployment programs, crime prevention with minimal law enforcement capabilities and the auditing of municipal and township budgets). The allocation of these services, primarily road construction and upgrading, often channel and shape the forces for urbanization and rural growth. Nearly all of the counties within the impact area have active planning commissions and staff which provide technical planning and engineering services to their townships often necessary for filing applications for state and federal funding programs. The counties' land use powers over their townships and municipalities vary from state to state and are generally limited to approval of subdivision proposals adjoining municipal boundaries and county roads, review of other development proposals as submitted, and the establishment of dedicated rights-of-ways by means of an official county map.

The wide variety of existing land use control mechanisms within the impact area is primarily due to the fact that the major powers lie with the townships and municipalities. The range of possible controls adopted is extremely broad and

the level of enforcement is even broader still. A preliminary survey of existing controls (zoning, subdivision regulations, building code, mobile home park ordinance, sign and billboard controls, etc.) on a township by township basis indicates that most had undertaken the preparation of the above controls, over half had gone ahead and adopted the controls, less than half had recent master plans prepared with less than one third adopting them as official plans. Taking zoning ordinances as the single most prevalent control, one finds a tremendous range between the highly sophisticated formula system for determining minimum lot sizes with lot area incentives for turning over additional approvals to Greenville Township to even the absence of the most elemental land use designations in several of the Pike County townships. As there is no state building code in New Jersey, each township has the opportunity to adopt any of the standard codes that suits their interest. A general appraisal indicates that Pennsylvania townships have far more lenient building codes than either New Jersey or New York.

Of greater concern is the financial feasibility of these rural townships with minimal budgets to properly enforce their own land use regulations much less those imposed on them by their respective states. The maintenance of low tax rates is a major objective in these townships with large percentages of households on fixed incomes. An example of this condition in Pennsylvania is the state requirement that all municipalities and townships have state licensed inspectors for enforcement of sewer installation regulations by March 15, 1975. The status as of February 5, 1975, was seven out of twenty-one for Monroe County; one out of thirteen for Pike County and two out of twenty-seven for Wayne County.

Finally, it is characteristic of the political climate of most of these rural Townships bordering the DWGNRA that self-determination and home rule are priority objectives. Interviews with township supervisors and planning board members indicate a sincere interest among those most aware of the necessity for adequate land use controls to regionalize these controls in order to share the problems and opportunities of DWGNRA related growth with surrounding townships and municipalities in all three states. This broad-minded approach is, however, commonly countered in the same breath with an adamant refusal to give up any powers to the state whether presently utilized or not.

#### XXI.D. SUMMARY: INSTITUTIONAL LINKAGES AND IMPLEMENTATION OF POLICY

No single level of government -- federal, state or local -- is fully responsible for or receives the full impact of the decisions discussed above. Each level of government has discrete responsibilities in which the other two share little or no power. Other responsibilities are shared roughly on a co-equal basis by all three. The principal inter-governmental challenge is in those instances where each level of government must approve of a project or decision in advance of its being implemented.

Federal responsibilities are broad and diverse. Principal among them are setting standards, requiring functional planning, regulating private enterprise and funding capital facilities. In a water supply area, the Federal Government requires the states to establish standards. Power generation standards and regulations are promulgated through the Federal Power Commission.

Flood control decisions are influenced by federal standards, planning requirements and funding of capital facilities. Water pollution control is a functional area in which the Federal Government has taken substantial interest in the 1970's. Standards, planning requirements and funding are all integral parts of the Federal Government's war on water pollution. Federal recreation policies play an important role in the implementation of open-space programs of nationwide importance. Here the Federal Government plays a direct role in implementing individual projects and assists states in the planning and construction of projects of importance to them.

State governments are playing a much greater role in decisions associated with urban public services than they have in the recent past. State governments have the responsibility for establishing standards, planning, regulating through an enforcement process the development of water supply facilities. State standards and regulations are imposed on private companies responsible for electric power generation. Flood control coordination is focused on state governments through their project planning and cost-sharing roles. Water quality management is an area where state governments are especially active at this time. They establish standards, plan, regulate and assist in the funding of water quality management projects. The same is true of recreation projects for which states have taken an active interest for many years.

Local governments have a principal responsibility for land use control, operation and maintenance of projects and in sharing their costs. Most planning and funding decisions are local ones. Maintenance and operation

of small flood control projects and sharing in the funding of them are local responsibilities. Water quality control is focused on planning, issuing relevant permits and sharing in the cost of facilities recommended in the plans. Recreation standards, planning and funding of community facilities have long been important concerns of local governments throughout the basin area.

These institutional responsibilities play major roles in the successful implementation of policies at the federal, state and local levels of government. Rising public service standards and costs have increased the role of the federal and state governments in project planning, programming and budgeting. However, since implementation takes place on a project-by-project basis, local control is a continuing and integral part of the public services process.

## BIBLIOGRAPHY

1. Rural Electrification Administration, U.S. Department of Agriculture, "Procedures", Code of Federal Regulation, U.S. Government Printing Office, Washington, D.C., December, 1966.
2. Federal Power Commission, Filing of Rate Schedule, Federal Register, U.S. Government Printing Office, Washington, D.C. 1974.
3. Public Service Commission, Annual Report, 1973, State of New York, Albany, 1974.
4. Betz Environmental Engineers, Regional Assessment Study of the Delaware River Basin for the National Commission on Water Quality, Plymouth Meeting, Pennsylvania, January 31, 1975. Division of Taxation, Department of Treasury of State of New Jersey, Annual Report, Trenton, N.J., 1975.
5. Commonwealth of Pennsylvania, The Pennsylvania Manual, Volume 101, Harrisburg, Pennsylvania, 1973.
6. State of New Jersey, Budget, State of New Jersey Fiscal Year 1975-76, Trenton, N.J., February, 1975.
7. Board of Public Utility Commissioners, 1972 Annual Report, Trenton, N.J., 1973.